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Variability of Relationship Evaluations & Physical Health Outcomes: Testing the Moderating Role of Implicit Theories of Relationships

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Variability of Relationship Evaluations & Physical Health Outcomes: Testing the Moderating Role of Implicit Theories of Relationships

by

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Dissertation

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Doctor of Philosophy

The University of Texas at Austin

August 2015

Dedication

In deciding whom to dedicate my dissertation to, I was met with a bit of anxiety, grief, excitement, and joy, but perhaps most fitting, I fluctuated in my feelings to choose to dedicate my dissertation and getting my Ph.D. to my mother, Cyndy Selecman Morgan. In the end, I realized that despite her struggles with variability and possibly because of these struggles, she helped me grow in many ways that have contributed greatly to this achievement. Most importantly, I have the determination to weather the fluctuations of this complicated world. I wish she were here to see me become what she always wanted for me, but I am grateful for the life she set me up for and the love I received for almost 25 years – it was enough to get me through, Momma.

Acknowledgements

Although I am perhaps not unique in this sentiment, getting my Ph.D. was the most challenging experience of my life, and I am grateful to the many individuals that supported me along the way. In particular, five individuals went above and beyond to carry me through to the end and even made the journey fun – Timothy Loving (my adviser and sometimes "academic therapist"), Thomas Morgan (my father and biggest cheerleader), Dylan Peele (my partner and dissertation life-saver), Shannon Perri (my cousin, but really sister), and Elizabeth Keneski (my friend, colleague, and future partner of Keneski-Morgan).

Variability of Relationship Evaluations & Physical Health Outcomes: Testing the Moderating Role of Implicit Theories of Relationships

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The University of Texas at Austin, 2015

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Variability (i.e., greater fluctuations) of relationship evaluations over time undermines current and future relationship and individual well-being. To date, greater variability of relationship evaluations has not been linked to individual physical health, yet *overall* relationship quality (e.g., initial or mean levels) is a strong predictor of several markers of physical health. The aims of the current study are three-fold—first, to explore new methods of capturing intra-individual variability; second, to replicate and extend previous findings on the damaging effects of variability by examining variability's association with relationship fate and physical health outcomes; and third, to investigate the potential moderating role of individuals' general relationship beliefs on these associations. I drew from a 9-month longitudinal study of 202 individuals who were in new dating relationships at the start of study participation *(M_{length}* = 3.28 months). The study included baseline self-reports of relationship satisfaction and Implicit Theories of Relationships (ITRs) as well as bi-weekly self-reports, for a total of up to 20 assessments per individual, of relationship status (together or not) and quality (semantic differential) and physical health (shortened SF-36). A series of analyses were conducted to obtain de-trended levels of intra-individual variability and a previously understudied measure of intra-individual change in relationship evaluations over time – temporal dependency (i.e.,

the extent to which one day's relationship evaluation is correlated with the previous day's evaluation). These two variables were subsequently entered into a Cox proportional hazards model to explain the effect of each on the likelihood of relationship dissolution. Both variability and temporal dependency of relationship evaluations (but not their interaction) predicted increased likelihood of experiencing relationship dissolution. Contrary to predictions, however, greater variability and temporal dependency (and their interaction) were not associated with changes in self-reported physical health over time; all three terms, however, predicted higher levels of average self-reported physical health across assessments. Finally, the hypothesized moderating effects of individuals' implicit theories of relationships were not supported. These findings emphasize the predictive power of individuals' patterns of relationship evaluations over time for relationship fate yet suggest additional research is needed to understand the association between variable relationship evaluations and health outcomes.

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INTRODUCTION

Budding relationships necessitate the buildup of pair interdependence over time; as individuals become closer, they must learn to coordinate their own needs with those of their partners (Altman, Vinsel, and Brown, 1981; Braiker & Kelley, 1979). This coordination comes at the expense of maintaining independence and control over one's own outcomes, resulting in a loss of autonomy (deCharms, 1968; Deci, 1975). Thus, individuals in new relationships engage in regular, careful evaluation to weigh the positives and negatives of involvement with a specific partner relative to life without that partner. These evaluations, for some, provide clear answers: Individuals may find themselves consistently or increasingly enchanted *or* discontented with their partners. Although in valence these situations are very different, each affords some certainty regarding the relationship's fate (Braiker & Kelley, 1979; Arriaga, Reed, Goodfriend, & Agnew, 2006).

Not all evaluations of budding relationships provide such clear direction. As Arriaga (2001) eloquently stated, "For others, the early period is a time of substantial uncertainty marked by moments of irrepressible attraction and other moments of stark disappointment (Braiker & Kelley, 1979), rendering the fate of the relationship unknowable" (p. 754). This context of frequently oscillating relationship evaluations undermines the confidence individuals strive for in their social relationships (Murray, 1999) and incites doubts of the viability of their relationships (Kelley, 1983; Whitton, Rhoades, & Whisman, 2014). In turn, this turbulence can damage relationship and individual well-being. Indeed, greater variability of relationship evaluations increases

the likelihood of relationship dissolution and the development of depressive symptoms (Arriaga, 2001; Whitton & Whisman, 2010).

Variability of relationship evaluations also predicts a host of other negative consequences for individuals and their relationships, including lower trust, more distress following conflicts, and decreased life satisfaction (Arriaga, 2001; Campbell, Rubin, Simpson, & Boldry, 2010; Whitton, Rhoades, & Whisman, 2014). To date, however, variability of relationship evaluations has not been connected to individual *physical health*, despite several lines of research linking the sequelae of variability of relationship evaluations, as well as overall relationship quality, to poorer mental and physical health outcomes (e.g., Barefoot et al., 1998; Burman & Margolin, 1992; Holt-Lunstad, Birmingliam, & Jones, 2008; Wright & Loving, 2011; Uchino, Holt- Lunstad, Uno, & Flinders, 2001). Thus, the first goal of the current study is to replicate and extend previous findings that connect variability to negative relationship and individual outcomes by examining if variability of relationship evaluations predicts relationship fate and physical health over time.[1]

The second goal of the current study is to test whether consideration of two specific individual differences potentially moderate the links between variability and relationship fate and self-reported physical health. Specifically, I examined the role of individuals' general beliefs about relationships (Implicit Theories of Relationships, ITRS; Knee, 1998) in potentially buffering or exacerbating the effects of variability of relationship evaluations on subsequent physical health outcomes. ITRs refer to

[1] For the remainder of the paper, I will use the term relationship "outcomes" to refer to

individuals' general beliefs regarding relationships, with individuals varying in the extent to which they endorse *destiny* beliefs (i.e., the belief in "The One") or *growth* beliefs (i.e., the belief that relationship difficulties can be overcome). These beliefs predict reactions to relationship conflicts—growth theorists are more likely to "work it out" whereas destiny theorists are more likely to end a relationship in the face of difficulties (e.g., Franiuk, Cohen, & Pomerantz, 2002). Thus, stronger destiny beliefs should predict stronger reactions to variable relationship evaluations, as destiny theorists are quicker to evaluate and diagnose the relationship's longevity. In addition, for those who vary more in relationship satisfaction, individuals with stronger growth beliefs may better tolerate those ups and downs given their tendency to view difficulties as opportunities to improve their relationships.

The remainder of the introduction is organized in the following manner: first, I review previous research on variability of relationship evaluations and individual and relationship outcomes, which includes subsections that review the foundational theories underlying research on variability of relationship evaluations, empirical tests of these original theories, and extensions to individual well-being; second, I discuss the relevant research on developing relationships and the merits of studying variability in the context of early relationship development; third, I draw from related research (e.g., self-esteem, uncertainty) that indirectly suggests variability of relationship evaluations may also affect individuals' *physical health* outcomes; fourth, I review previous findings that speak to the importance of individuals' implicit theories about relationships for developing relationships and

outline theoretical support for the hypothesis that individuals' growth and destiny beliefs (separately) will moderate the association between variability and physical health outcomes; finally, I provide an overview of the current study.

REVIEW OF RESEARCH ON VARIABILITY OF RELATIONSHIP EVALUATIONS

Variability of Relationship Evaluations and Individual and Relationship Well-Being

A primary aim of relationship science is to better understand and predict relationship and individual functioning. Dating back to the early roots of the field, researchers have attempted to achieve this understanding by focusing on assessments of relationship quality (e.g., Burgess & Cottrell, 1939; Davis, 1929; Terman, Buttenweister, Ferguson, Johnson, & Wilson, 1938). Over 80 years later, although debate abounds regarding how best to measure relationship quality (e.g., Berscheid & Regan, 2005; Fincham & Beach, 2006; Hendrick, 1995; Trost, 1985), the manner in which various measures are administered is fairly consistent: participants are presented with one of any number of relationship quality scales and asked to provide their subjective assessment of the state of their romances (Fincham & Bradbury, 1987). This focus on individuals' relationship evaluations has proven fruitful, as individuals' subjective views of their relationships (e.g., satisfaction) are powerful predictors of relationship and individual health and longevity (e.g., Jacobson, 1985; Gove, Hughes, & Style, 1983; Weiss & Aved, 1978).

Despite the utility of collecting self-report measures of relationship quality, this approach comes with limitations (Caughlin & Huston, 2002). For example, some

individuals' current relationship evaluations are highly dependent on recent events; thus, a single evaluation may capture an individual's feelings specific to the moment of assessment rather than characterize the overall quality of the relationship (Berscheid & Lopes, 1997). Moreover, individuals' current evaluations may reflect one point on a gradual trend over time. A single evaluation does not address the manner in which individuals' relationship perceptions change over time (e.g., Bradbury, 1998). Because of these and other issues with cross-sectional approaches to measuring individuals' relationship evaluations, an isolated self-report may not lend a precise prognosis of a given relationship's sustainability (Berscheid & Lopes, 1997). Instead, the pattern of relationship evaluations *over time*, and the degree to which that pattern is inclining versus declining or stable versus variable, regularly proves to be a more nuanced predictor of relationship fate and outcomes (e.g., Karney & Bradbury, 1995; Arriaga, 2001). Researchers have thus argued that the *trajectory* of evaluations over time is more representative of overall relationship quality than is a single, global evaluation (e.g., Fincham & Rogge, 2010).

Indeed, the trajectories of individuals' relationship evaluations vary substantially and provide unique information regarding a given relationship's health. On the one hand, some individuals maintain stable or increasingly positive relationship evaluations. As their relationships progress, the outcomes provided continue to be rewarding and inspire continued positive relationship sentiments. On the other hand, some individuals experience stably low levels or consistent declines in the positivity of their evaluations (Bradbury, 1998; Braiker & Kelley, 1979). For these individuals, the

perceived outcomes are, at best, mediocre and encourage a growing disengagement from the relationship. Each of the previously described trajectories reflects distinct relationship experiences and is associated with vastly different outcomes, with stable or increasing positive evaluations associated with better relationship outcomes compared to stably less positive or declining positive evaluations (Karney & Bradbury, 1995).

But regardless of their disparate associated outcomes, such trajectories of relationship evaluations provide individuals with a fairly clear sense of the immediate future of their relationships (Kelley, 1983; Arriaga, 2001; Arriaga et al., 2006). Thus, individuals with stable or steadily changing (increasing or decreasing) relationship evaluations may find some relief from the uncertainty characteristic of developing relationships. Contrast these prototypical patterns, however, with an individual whose relationship evaluations demonstrate a constant shift between positive and negative sentiments from assessment to assessment (Arriaga, 2001; Whitton & Whisman, 2010). These individuals may struggle to feel any confidence in the future of their relationships, as their prior relationship evaluations have not yielded a consistent pattern over time. In fact, even when an individual's relationship evaluations demonstrate an upward linear trend on average, if those evaluations fluctuate wildly along that path, the individual's relationship is more likely to dissolve relative to an individual not reporting such a tumultuous trajectory (Arriaga, 2001). This somewhat counterintuitive finding – that individuals with variable but increasing relationship satisfaction are equally, if not more, likely than individuals with variable but declining

relationship satisfaction to see their relationships end – begs the question: What is it about variability, above and beyond linear trends or overall positivity or negativity, that undermines relationship futures?

Variability of Relationship Evaluations: A Reflection of Poor Relationship Conditions or a Cause of Negative Relationship Dynamics?

Kelley (1983) theorized that fluctuating relationship evaluations reflect changes in the perceived ratio of positive to negative relationship experiences. When the balance of perceived relationship positives to negatives shifts – likely resulting from increases in the presence or severity of relationship problems relative to relationship benefits - individuals may sometimes experience hopeful moments that inspire positive evaluations and at other times experience moments of despair that rouse negative evaluations. In light of these unpredictable relationship circumstances, individuals are motivated to reduce their relational uncertainty through more careful evaluations of the relationship's strengths versus weaknesses. Thus, variability promotes regular consideration of the advantages of persistence in the current relationship. Further exacerbating this link between variability and subsequent relationship outcomes, variability of relationship evaluations also incites doubts regarding the relationship's future; individuals with fluctuating relationship evaluations find themselves less assured in the reliability of their partners. Together, Kelley's notions set the stage for our understanding of how variable relationship evaluations function within a romantic relationship. Fluctuations in one's feelings

towards the partner or relationship emerge from relationship distress and stimulate even more relationship distress.

Empirical Tests of Kelley's (1983) Theories on Variability

Arriaga (2001) first demonstrated empirically the significance of variable relationship evaluations for relationship fate and outcomes in a sample of newly dating individuals (M_{length} = 8 weeks at start of study). Participants reported their current relationship status and satisfaction weekly for up to ten assessments. Using growth curve analytic techniques, she found that greater variability of relationship evaluations was associated with lower levels of commitment and an increased likelihood of relationship dissolution above and beyond initial, average, or linear slope levels of relationship satisfaction over time.

Campbell and colleagues (2010) extended these findings by further outlining the cognitive, behavioral, and dyadic processes associated with variable relationship evaluations. Guided by theories of dyadic trust, Campbell et al. (2010) built on Kelley's (1983) ideas by suggesting that lower partner trust is at the root of shifting relationship evaluations. Individuals with lower levels of trust in their partners are less able to incorporate both positive and negative partner characteristics into their overall view, which leads them to shift between positive and negative views depending on specific relationship experiences (Holmes & Rempel, 1989). Campbell et al. (2010) hypothesized that greater variability of relationship evaluations would be associated with both lower levels of trust and more compartmentalized (i.e., less integrated)

knowledge structures of the partner compared to more stable relationship evaluations.

To test these ideas, dating and cohabiting individuals and their partners reported their initial levels of partner trust and their relationship and partner perceptions daily for up to 21 days. In addition, their Study 1 involved an in-lab videotaped conflict resolution task following the diary component of the study. The second study included a reaction-time decision-making task (Graham & Clark, 2006) in which participants were asked to identify as quickly and as accurately as possible whether or not a set of positive and negative words characterized their partners (Campbell et al., 2010). Slower response times indicated greater compartmentalization or less integration of the positive and negative aspects of the partner.

Lower levels of one's own self-reported trust in the partner and lower levels of the partner's self- reported trust predicted greater variability of relationship evaluations, and this variability predicted a host of negative relationship outcomes, including more compartmentalized knowledge of the partner, more negative conflict resolution behavior, and greater reactivity to conflict (Campbell et al., 2010). These findings portray the relationship-taxing manner in which individuals with fluctuating relationship evaluations store and process partner and relationship information.

Extending the Effects of Variability to Individual Well-Being

The studies above emphasize the detrimental effects of variability of relationship evaluations for *relationship* well-being. Building on this foundational research, other studies reveal the effects of variability on *individual* well-being

(Whitton & Whisman, 2010; Whitton et al., 2014). Specifically, in a sample of cohabiting and married women, greater variability of self- reported relationship quality was associated with more self-reported depressive symptoms (Whitton & Whisman, 2010). In another study by Whitton and colleagues (2014), long-term dating participants that exhibited greater variability of relationship evaluations experienced decreases in life satisfaction and increases in psychological distress. In a direct test of Kelley's original postulating on variability's association with increased relational doubts (1983), Whitton and colleagues also found that declines in relationship confidence (or increased relational uncertainty) partially mediated these associations. Thus, individuals who experience greater fluctuations in relationship quality over time risk harming their relationships *and* their own well-being, in part because variability of relationship evaluations provokes greater relationship doubts.

In sum, the previous research on variability of relationship evaluations emphasizes the importance of variability for individual and relationship functioning and underscores the need for future research to continue examining individuals' perceptions of relationship quality over time. In the next section, I explain why variability of relationship evaluations at the start of a new relationship may be especially troublesome for individuals and their relationships in light of the processes accompanying relationship development.

VARIABILITY IN THE EARLY STAGES OF RELATIONSHIPS

Relationship beginnings mark a complex transitional stage of relationship

development (Keneski & Loving, 2014), during which the expanding interdependence typical of emerging relationships rouses intrapersonal and interpersonal challenges individuals must overcome to sustain their relationships (Braiker & Kelley, 1979). At the intrapersonal level, individuals experience greater relational ambivalence[2] in the early stages of relationships compared to later, more established stages. Individuals are intrinsically motivated to maintain control over their own outcomes (deCharms, 1968), yet cultivating new relationships requires that individuals relinquish some of that control to their partners (Braiker & Kelley, 1979). In an attempt to manage the uncertainty arising from this dilemma, individuals regularly assess the relationship's merits to weigh the advantages of continuance in the current relationship versus maintaining independence (Keneski & Loving, 2014). Individuals must make these initial evaluations with relatively little knowledge of their partners and fewer relationship experiences from which to draw (Berger & Calabrese, 1975); this context increases individuals' vulnerability to potentially negative outcomes and further

[2] Relationships researchers generally use the terms "ambivalence" and "relational uncertainty" interchangeably (e.g., Braiker & Kelley, 1979). Recently, researchers have distinguished ambivalence as the experience of holding equally positive and negative views of partners (Uchino et al., 2001) whereas relational uncertainty reflects the experience of lower confidence in the relationship (Knobloch & Solomon, 1999, 2002). However, these concepts are highly related (Keneski, Schoenfeld, & Loving, 2013), and often, researchers use the term "uncertainty" to characterize the "emotional experience of feeling ambivalent about one's partner or relationship as well as the cognitive experience of being unsure about the current state or future of one's relationship (Berger, 1979)" (Keneski & Loving, 2014, p. 128). Thus, in order to be consistent with the original theories I draw from to formulate my hypotheses (Braiker & Kelley, 1979; Kelley, 1983a), I will use the terms "uncertainty" and "ambivalence" synonymously.

contributes to the ambivalence experienced as relationships develop (Altman et al., 1981; Kelley, 1983; Murray, 2005).

While managing the ambivalence surrounding whether or not to (further) commit, individuals must simultaneously manage the continuous influx of new partner information that emerges as couple members grow closer (Kelley, 1983). As relationships progress, individuals interact more frequently and become more comfortable with one another, leading them to reveal increasingly personal information over time (Altman & Taylor, 1973). With each new discovery of a partner, individuals evaluate whether or not their partners' attributes and goals are in line with their own individual and relationship goals (Keneski & Loving, 2014; Sunnfrank, 1986a, 1990). When individuals perceive a mismatch in their long-term motives, they encounter an interpersonal challenge – a conflict of interests (Braiker & Kelley, 1979). This conflict often arises when a discrepancy is discovered between partners' willingness to increase involvement, for example. Other interpersonal challenges may surface with increased interaction, such as behavioral interference (i.e., when the actions of the individual's partner are perceived to impede an individual's own goals) or when couple members' personalities are incompatible (Braiker & Kelley, 1979). These interpersonal challenges, in turn, can kindle further intrapersonal tension (Braiker & Kelley, 1979). For instance, in discovering differences in their long-term goals, individuals may feel uncertain as to whether they should remain steadfast in their personal goals or compromise their own desires for the well-being of their relationships. Alternatively,

unhappiness resulting from an interpersonal conflict (e.g., a particularly negative argument) may increase ambivalence as social norms set expectations for elevated levels of happiness during the early stages of a relationship (Braiker & Kelley, 1979).

The manner in which individuals resolve these early challenges and incorporate new information into their global relationship views dictates a relationship's course (Braiker & Kelley, 1979; Arriaga, 2001). When individuals encounter unpleasant relationship experiences, they have two options: to transform their perceptions to create mutual interests (transformation of motivation; Kelley & Thibaut, 1978) or to maintain their own self-interests (Kelley, 1983b). Over time, individuals that regularly engage in transformations of motivation when challenges arise will develop a pro-relationship orientation that, if reciprocated by individuals' partners, promotes positive relationship evaluations and relationship endurance (Arriaga, 2001; Holmes, 1981; Kelley, 1983b). Individuals that remain loyal to their own motives will instead develop a more self-interested orientation, eventually leading them to feel more negatively about the relationship and subsequently disengage from it (Arriaga, 2001; Kelley, 1983b).

Still other individuals will struggle to develop a stable orientation at all (Arriaga, 2001). These individuals constantly shift between feeling motivated to foster their relationships and feeling motivated to protect their own self-interests (Arriaga, 2001) because either they or their partners are unable to maintain consistent patterns of behavior that yield stable outcomes, and thus stable relationship evaluations (Kelley, 1983a). Arriaga (2001) proposed that variable relationship evaluations may be

especially important to examine in the context of new relationships as developing a stable pro-relationship orientation early on helps individuals manage the challenges of a new relationship. When individuals fail to develop stable orientations (either in favor of the relationship or in favor of independence), intrapersonal (e.g., ambivalence) and interpersonal (e.g., negative relationship interactions) challenges inherent to a new relationship should be exacerbated, as individuals cannot gain traction in one direction or the other (Arriaga, 2001). Importantly, these challenges can be taxing on individuals' physical health, especially when they are unresolved and amplified (Uchino et al, 2001; Wright & Loving, 2011). Thus, variable relationship evaluations should be particularly harmful in the early stages of relationship development and should predict relationship fate *and* declines in physical health over time. To my knowledge, previous research has not yet connected variable relationship evaluations to physical health outcomes despite the relevant findings that indirectly suggest this association, which I review in the following section.

LINKING VARIABILITY OF RELATIONSHIP EVALUATIONS TO PHYSICAL HEALTH OUTCOMES

Although the links between individuals' subjective evaluations of their relationships and their physical health outcomes are well-established (e.g., Holt-Lunstad et al., 2008; House, Landis, & Umberson, 1988), researchers have mostly relied on single moments or linear trends of individuals' reports of their relationship views (Robles, Slatcher, Trombello, & McGinn, 2014) and have not yet considered the

degree to which greater fluctuations of relationship evaluations over time may undermine health. In light of mounting evidence that the variability of an individual's relationship evaluations provides more diagnostic information about a range of relationship and individual outcomes (Campbell et al., 2010; Whitton et al., 2014), it is plausible that variability of relationship evaluations may not only predict relationship fate, above and beyond mean levels, but may also exhibit the same enhanced predictive power for individuals' physical health outcomes. Below, I outline three specific reasons variability of relationship evaluations may induce physical harm to the individual experiencing this volatility.

First, variability of relationship evaluations predicts declines in individuals' mental health, including increased levels of depression and psychological distress and declines in life satisfaction (Whitton & Whisman, 2010; Whitton et al., 2014). Poor mental health outcomes are often comorbid with poorer physical health, with rises in mental illness being associated with decreased physical health outcomes (e.g., lowered immune functioning, Dentino et al., 1999; Maes et al., 1995; Lutgendorff et al., 1999). The poorer mental health outcomes resulting from variable relationship evaluations emerge from the stress induced by thwarted desires for consistency and certainty in relationship experiences (Murray, 1999; Whitton et al., 2014). Thus, the stressful experience of fluctuating feelings about the relationship should affect individuals mentally and physically, as mental and physical health outcomes often co-occur (Cohen & Rodriguez, 1995; Maes et al., 1998).

Second, the relational uncertainty caused by variable relationship evaluations

may also contribute to physical functioning, as uncertainty undermines the need for control most individuals desire across many aspects of life (e.g., Abramson, Seligman, & Teasdale, 1978; Deci & Ryan, 1985; Fisher, 1984). A lowered perception of control is one of the defining features of perceived stress, which is linked strongly to a host of negative physical health outcomes (Cohen, Kamarck, & Mermelstein, 1983; Krantz, Whittaker, & Sheps, 2011). In fact, several items of the Perceived Stress Scale focus on controllability (e.g., "In the last week, how often have you felt you were unable to control the important things in your life?"; Cohen, Kamarck, & Mermelstein, 1983). When individuals perceive less control over a given situation, they experience greater psychological stress and worse psychophysiological functioning (e.g., Trier Social Stress Task, Dickerson & Kemeny, 2004). In the context of newly developing relationships, unstable relationship evaluations should increase stress and poor health outcomes given the lack of confidence individuals have in their relationships and partners. Indeed, when individuals report greater uncertainty about their partners, they also demonstrate delayed physiological recovery following supportive or conflictual interactions with their partners (Priem & Solomon, 2011). Furthermore, when individuals hold both positive and negative views of their interaction partners, they experience increased cardiovascular reactivity following stressful interactions with these ambivalent partners (Uchino et al., 2001). Taken together, these findings suggest that the uncertainty and perceived lack of control associated with fluctuating relationship evaluations may lower healthy functioning.

Third, intra-individual variability, in general, is garnering increased attention

from scholars because of the apparent link between variability (broadly construed) and health. For example, individuals that hold variable *self*-evaluations (i.e., fluctuating self-esteem) experience increases in arterial stiffness over time (Ross, Tomfohr, & Miller, 2013) – a sign of declining vascular function that may reflect early stages of atherosclerosis (Holewijn, den Heijer, Stalenhoef, & de Graaf, 2010). Moreover, when individuals fail to maintain stable emotions over time, they are also at risk of experiencing increased heart-rate variability – a marker of cardiovascular health (Gruber, Kogan, Quoidbach, & Mauss, 2013). Collectively, these and other studies highlight the fact that individuals desire consistency and control over their outcomes and that variability, in general, is a potent marker of the extent to which individuals are capable of maintaining such consistency.

In sum, although previous findings have not directly linked variability of relationship evaluations to health outcomes, the lines of work reviewed above provide strong support for the hypothesis that variability of relationship evaluations may result in poor physical health outcomes. In the final section, I propose that individuals' general beliefs about relationships – Implicit Theories of Relationships (Knee, 1998) - moderate any observed associations between variability of relationship evaluations and relationship fate and health outcomes.

THE MODERATING ROLE OF IMPLICIT THEORIES OF RELATIONSHIPS

Individuals vary in the extent to which they hold different implicit beliefs regarding a variety of human attributes (e.g., intelligence, personality) – specifically in regards to the stability and malleability of those attributes (for reviews, see Dweck, 2006; Molden & Dweck, 2006; Ross, 1989). Over the last two decades, a burgeoning literature

demonstrates the significance of individuals' implicit theories of romantic relationships (ITRs) for understanding relationship dynamics and outcomes (e.g., Finkel, Burnette, & Scissors, 2007; Frankiuk, Cohen, & Pomerantz, 2002; Knee, 1998).[3] Specifically, individuals can vary in the extent to which they endorse destiny beliefs (the belief in "The One" or fate) and growth beliefs (the belief that relationship issues can be overcome and improve the relationship), and these beliefs represent conceptually and statistically distinct (i.e., orthogonal) dimensions (Knee, 1998; Knee, Nanayakkara, Victor, Neighbors, & Patrick, 2001; Knee, Patrick, & Lonsbary, 2003).

Strong endorsement of growth beliefs involves believing that relationships evolve over time and that problems can be resolved and potentially lead to a stronger relationship (Knee, 1998). The goal of an individual with strong growth beliefs is to maintain and improve the relationship over time; thus, individuals with stronger growth beliefs have fewer one-night stands and tend to date the same person for a longer about of time (Knee, 1998). Furthermore, higher growth beliefs have been associated with more attempts to maintain or repair a relationship when problems arise (Knee, 1998). Destiny beliefs involve the belief that two individuals are either meant to be together or not ("destined") and are associated with frequent diagnosing of the future potential of the relationship (Knee, 1998). As a result, individuals with stronger destiny beliefs tend to have long-lasting relationships to the extent that they feel their partner is "The One", yet for destiny believers, the presence of problems – particularly early in the relationship – is associated with disengagement with the partner and relationship (Knee, 1998; Knee et al., 2001). These beliefs are implicit in that, similar to implicit theories of achievement or

[3] Franiuk and colleagues (2002) refer to similar implicit theories, which they refer to as "soul-mate" beliefs and "work-it-out" beliefs.

intelligence, they are typically strongly held yet not explicitly expressed (Dweck, 2006; Knee, 1998).

Despite the somewhat un-articulated nature of these beliefs, previous research on romantic relationships suggests that individuals' mental models of general relationship dynamics affect their interpretations of interactions with their partners, the strategies they use to manage stressful relationship events, the value they place on the match between their partner's attributes and their ideal partner's attributes, and the extent to which they persist in versus abandon the relationship when challenges arise (Franiuk et al., 2002; Knee, 1998; Knee et al, 2001). In particular, the majority of effects associated with individuals' implicit theories of relationships are interaction effects, in which growth or destiny beliefs moderate associations between other relationship factors (for a review, see Knee & Canevello, 2006). For example, perceiving a greater discrepancy between one's current and one's ideal partners predicts lower relationship satisfaction – especially so for individuals who more strongly endorse destiny beliefs and less so for individuals with stronger growth beliefs (Knee et al., 2001). Furthermore, following semi-structured interviews designed to emphasize discrepancies in how partners view their relationship, growth theorists reported increased happiness and decreased levels of depression, whereas destiny theorists reported increased feelings of hostility (Knee et al., 2001). Similarly, perceived conflict (particularly when unresolved) has been associated with lower commitment, yet strong growth beliefs appear to buffer individuals from these negative effects of relationship issues (Knee, Patrick, Vietor, & Neighbors, 2004). Alternatively, when conflicts arise in a destiny theorist's relationship, she or he is likely to respond passively and to avoid contact with the partner (Franiuk, Cohen, & Pomerantz, 2002). Together, these studies indicate that growth beliefs may buffer individuals from

otherwise distressing relationship events, and destiny beliefs may exacerbate the results of these events.

In the present research, I predicted that destiny beliefs and growth beliefs would moderate the associations between variability of one's relationship evaluations across assessments and relationship fate or self-reported physical health outcomes. First, subscribing to destiny beliefs should be associated with especially detrimental effects of fluctuating relationship evaluations. Strong (vs. weak) destiny theorists readily diagnose the viability of the relationship based off of immediately available information (Knee & Canevello, 2006, Knee et al., 2003). For example, when strong destiny theorists are experiencing state attachment anxiety, they are more likely to analyze their own thoughts and experiences when evaluating the meaning of offenses, are more likely to draw long-term conclusions from these (sometimes fleeting) thoughts, and are less likely to forgive their partners for any offenses (Finkel, Burnette, & Scissors, 2007). This moderation was mediated by individuals' levels of trust, such that destiny theorists tended to make these inferences because of their lowered trust in their partners following an offense. Thus, for destiny theorists, relationship events represent meaningful opportunities to diagnose the relationship's potential and can inspire less trust in the partner.

In fact, these relationship events (if not entirely positive) can lead individuals to become more aggressive. For example, when individuals with destiny beliefs feel ostracized, they tend to behave more aggressively and report more aggressive feelings (Chen, DeWall, Poon, & Chen, 2012). In regards to the current study, destiny theorists may be especially likely to experience increased likelihood of breakup, as the experience of volatile relationship evaluations may signal that the relationship is not likely to survive in the long-term and thus may lead individuals to disengage sooner rather than later. These individuals may also be at risk of increased decline in self-reported physical health

over time as a function of their fluctuating relationship evaluations, as they may feel especially distressed from any relationship issues.

Second, stronger endorsement of growth beliefs should be associated with weakened links between variable relationship evaluations and subsequent relationship fate and outcomes. Individuals with stronger growth beliefs tend to approach relationship difficulties with as opportunities to improve the relationship and even sometimes have positive responses to otherwise distressing interactions with their partners (e.g., Knee et al., 2001). Theorists have argued that these individuals *expect* ups and downs in their relationships (Knee, 1998). As a result, experiencing fluctuations of relationship evaluations over time may not be associated with relationship fate and physical health outcomes over time for growth theorists.

The majority of research in this area has examined the effects of growth and destiny beliefs separately; however, two empirical articles have reported analyses investigating their interactive effects (Franiuk et al., 2002; Knee et al., 2001). Given that most research on implicit theories of relationships treats these beliefs as separate, independent dimensions, my primary hypotheses involve the effects of the two-way interactions between variability and either destiny *or* growth beliefs. However, I will test for the three-way interaction between variability, growth beliefs, and destiny beliefs, to predict subsequent relationship fate and physical health outcomes, under the prediction that of those individuals who experience greater variability of their relationship evaluations, individuals with stronger growth beliefs coupled with lower destiny beliefs will have improved chances of relationship survival and less declines in physical health over time compared to individuals with lower growth beliefs and higher destiny beliefs.

OVERVIEW OF THE CURRENT STUDY

Variability of relationship evaluations is known for its association with a multitude of negative individual and relationship outcomes (e.g., Campbell et al., 2010; Whitton et al., 2014). I will investigate if variability of relationship evaluations predicts relationship fate and declines in individuals' physical health. Furthermore, I will test if individuals' general beliefs about relationships (growth and destiny, separately) moderate the associations between variability and subsequent relationship fate and individual health outcomes. To address these aims, the current study will draw from a sample of newly-dating individuals that provided baseline assessments of their endorsement of growth and destiny beliefs and reported their relationship evaluations and physical health biweekly over nine months as part of a larger study on early dating experiences.

Analyses will be conducted in two general stages. First, I will conduct preliminary analyses to obtain a measure of variability for each participant, starting with autoregressive procedures suggested by Wang et al. (2012) to derive measures of the amplitude of fluctuations and the temporal dependency of individuals' relationship evaluations. Second, a series of analyses, including a discrete time hazard analysis and multi-level modeling will be conducted to test the primary hypotheses.

METHOD

PARTICIPANTS AND PROCEDURES

The data for the proposed project will be drawn from a larger study, known as the University of Texas Dating and Transition Experiences Study (UT-DATES), a project conducted by Dr. Timothy Loving and funded by the National Institute of Child Health and Human Development (NICHD) that was designed to examine emerging adults' experiences during the early phases of a dating relationship. Researchers recruited participants over a 12-month period through newspaper and online advertisements, as well as through fliers posted around the greater Austin metropolitan area. Individuals were offered up to $75 in exchange for their participation. If interested in taking part in the study, individuals were directed to a secure website, where they completed an online screening questionnaire. Individuals were required to be over the age of 18, in good mental and physical health, residents of Austin or the surrounding area for the duration of the study, and in a relationship of less than 6 months duration in order to participate; those who met these criteria were subsequently contacted by an undergraduate research assistant who provided more details about the study.

In total, 245 individuals (28.6% male, 71.4% female) were eligible, agreed to participate, and followed through on enrolling in the study. Most respondents were involved in heterosexual relationships (93.47%), with the exception of 16 individuals involved in same-sex relationships (5 male-male, 11 female-female). Participants ranged in age from 18 to 25 years (M = 20.48; SD = 1.83), and the vast majority of

participants were currently enrolled in college or graduate school (93.88%). About half of the respondents self-identified as non-Hispanic Whites (49.8%), although a substantial minority of participants described themselves as Asian (26.9%) or Hispanic (25.7%), with the remaining participants describing themselves as either African American (3.3%), American Indian (2.0%), other (1.2%), or "don't know" (1.2%).

After completing the prescreening questionnaire, eligible participants were provided with a link to the baseline questionnaire as well as instructions on how to complete the 18 biweekly follow-up assessments.[4] Approximately every two weeks, participants were emailed a link to a secure website hosting an electronic version of the biweekly questionnaire. The emails were sent two weeks following the completion of participants' prior assessment and not on a strict biweekly schedule (an average of 17.80 days passed between the completion of each biweekly assessment; *Mdn* = 15; *SD* = 7.50; *Range* = 10–82). A courtesy reminder email was sent to participants who failed to complete the survey within one week. The average individual completed 12.38 out of a possible 18 biweekly assessments (*Mdn* = 14; *SD* = 5.00, *Range* = 0–18). At the beginning of each biweekly survey, participants were asked to report their relationship status with their original partners. Participants who experienced a breakup over the course of the study were directed to an alternative questionnaire in which

[4] Although not relevant to the current study, participants also attended a laboratory session at some point over the course of the study (participants were randomly assigned to either visit the laboratory soon after completing their baseline questionnaire or to attend after they had already been involved in the study for several weeks), during which they completed the Trier Social Stress Test (Kirschbaum, Pirke, & Hellhammer, 1993), a commonly used paradigm that has been shown to reliably induce psychosocial stress, and provided a series of saliva samples.

some questions no longer relevant to the participant were removed. Although not relevant to the current study, those who broke up with their partners were still eligible to continue participation. At the conclusion of the study, participants were sent a final questionnaire, producing a total of 20 possible assessments for both individuals whose original relationships remained intact and individuals whose original relationships dissolved.

The final sample for the current study consisted of 202 individuals (25.74% male, 74.26% female) who completed the baseline and at least three biweekly assessments.[5] At least three assessments of the semantic differential measure (SMD; Karney & Bradbury, 1997) – the measure of relationship evaluations at each biweekly assessment – were needed in order to compute a measure of variability of relationship evaluations for the individual. Thus, individuals who either dropped out of the study for an unknown reason or broke up with their partner before the third biweekly assessment were removed from the final sample. Those who were excluded from the study did not differ significantly from those included in the final sample in terms of age, $t(243) = 0.14$, $p = .89$. However, those who remained in the study reported significantly higher levels of initial relationship satisfaction, $t(235) = -2.99$, $p < .01$, and more positive relationship evaluations on average than those who dropped out of

[5] Six individuals were dropped because they did not complete even the baseline survey, and another 37 individuals were dropped because they did not complete at least three biweekly assessments – the minimum number of observations required to calculate within-person estimates of variability.

the study, $t(237) = -5.04$, $p < .0001$.[6] Additionally, those excluded from the final sample were marginally more likely to be male, Fisher's exact test: $p = .07$, and significantly more likely to experience a breakup, Fisher's exact test: $p < .001$, than those included in the final sample. The significant differences found between samples suggest these findings may not generalize to the broader population.

As expected, not all individuals' romantic relationships survived the duration of the study. Overall, 112 individuals (55.44%) were still together with their original partners at their last point of contact with the study researchers, leaving 73 participants (36.14%) who reported experiencing a breakup at some point over the course of the study.[7] Prior to the dissolution of his or her relationship, the average participant dated their partner for 7.73 months (*SD* = 3.03, *Range* = 2.93–15) and completed 5.91 assessments following the initial baseline survey (*SD* = 4.24, *Range* = 1–18).

MATERIALS

The data described below were collected in three primary stages – a baseline assessment, up to 18 biweekly assessments, and a final assessment. Each of the major study variables from the baseline, biweekly, and final assessments are described below, with means, standard deviations, and ranges for each displayed in Table 1 and correlations displayed in Table 2.

[6] The *n*s for initial relationship satisfaction and average levels of relationship evaluations across assessments are 237 and 239, respectively. Out of the 239 individuals who completed the baseline assessment, two participants skipped the 1-item relationship satisfaction question.
[7] 17 did not complete the final assessment and thus, have unconfirmed relationship statuses.

Major Variables of Interest

Relationship Status

Relationship status was measured at each assessment using a single item asking participants to report whether or not they were still romantically involved with their original partner. I derived a two-level breakup status variable consisting of the group of participants whose relationships persisted versus the group whose relationships ended, with the breakup group receiving a 1 and the intact group receiving a 0.

Relationship Evaluations

Relationship evaluations were assessed using the semantic differential measure (SMD; Karney & Bradbury, 1997). At each time point, participants rated their relationship on 7-point scales between 15 pairs of opposing adjectives, including the following: interesting—boring (reverse-scored), bad—good, unpleasant—pleasant, full—empty (reverse-scored), weak—strong, satisfied—dissatisfied (reverse-scored), lonely—friendly, sturdy—fragile (reverse-scored), rewarding—disappointing (reverse-scored), discouraging—hopeful, enjoyable—miserable (reverse-scored), tense—relaxed, stable—unstable (reverse-scored), happy—sad (reverse-scored), stressful—peaceful). A summed composite score was created for each individual at each time point, with higher scores indicating more positive evaluations (αs ranged from .95 to .98).

Physical Health

Participants completed the SF-36 Health Survey (Ware & Sherbourne, 1992), a measure of physical health developed by the RAND Corporation as part of the Medical Outcomes Study at each of the 20 assessments. The full scale is a 36-item survey of general physical and mental health, not specific to any disease or age group, and was completed at the baseline and final assessment. The biweekly assessments included two

specific items from the SF-36 to mark general physical health scores for each individual. Specifically, individuals were asked to rate their health, in general, on a scale from 1-5, with 1 being poor and 5 being excellent. Next, individuals were asked to rate their health now compared to two weeks ago using the following scale: 1 = Much worse than two weeks ago; 2 = Somewhat worse than two weeks ago; 3 = About the same; 4 = Somewhat better now than two weeks ago; 5 = Much better now than two weeks ago. An average score was created of the two items at each of the 20 assessments, with higher scores indicating healthier functioning.

Implicit Theories of Relationships

At the baseline assessment, individuals reported on their general beliefs regarding relationships. The scale for the current study was adapted from the 22-item measure developed by Knee and colleagues (2003). The scale was reduced to six items, with three items for destiny beliefs and three items for growth beliefs. The three items for destiny beliefs were as follows: "The success of a potential relationship is destined from the very beginning", "To last, a relationship must seem right from the start", and "A relationship that does not get off to a perfect start will never work". The three items for growth beliefs included: "A successful relationship evolves through hard work and resolution of incompatibilities", "Challenges and obstacles in a relationship can make love even stronger", and "It takes a lot of time and effort to cultivate a good relationship". Participants reported their agreement with the six items on a 9-point scale that ranged from 1 (strongly disagree) to 9 (strongly agree). For the three destiny items, higher numbers indicated higher destiny beliefs ($\alpha = .75$); for the three growth items, higher numbers indicated higher growth beliefs ($\alpha = .66$).

Relationship Length

The current study involved the use of two major analytic techniques: growth curve modeling and discrete-time hazard techniques (each of which is described in more detail below). Each technique addresses a different question of interest and requires the data to be structured and treated differently. Specifically, relationship length, or the amount of time the individual had been romantically involved with the partner up to the date of assessment, could not be treated consistently across both sets of analyses. For the growth curve models predicting changes in physical health over time, relationship length could be treated as a time-varying, continuous variable. Yet for the time hazard analyses, I treated the phase of the study as the major indicator of time, and I created and included additional variables as covariates to capture the amount of time participants had been involved with their partners. I outline the various ways I measured relationship length (or time) in detail below.

Two questions were used to determine the amount of time individuals had been involved with their partners. As part of the prescreening process, participants were asked to indicate the month, day, and year they began dating their partners. At each of the 19 assessments following the baseline questionnaire, participants were asked whether or not they had broken up with their partners, and if so, to indicate the exact date of their breakup. Using this information, two types of variables were created. The first item was a continuous variable representing the length of the relationship, coded in months (for use in growth curve analyses, and the value of which changed from assessment to assessment). For those who reported that their relationships were still intact at any given

assessment, the length of the relationship reflects the amount of time they had been involved with their partners up until the date of the assessment. Alternatively, for those who reported at any given assessment that their relationships had ended, the relationship length for that time-point reflects the length of their relationships until the date that their relationships dissolved. Those who stayed together with their partners throughout the course of the study and those who experienced a breakup at some point reported comparable lengths of involvement at each assessment (*p*s ranged from .12 to .97). In other words, individuals that eventually experienced a breakup did not report dating their partner for significantly longer or shorter at each assessment than individuals who remained with their partners.

The second set of items measuring relationship length consisted of 20 dichotomous variables (one for each assessment), representing whether or not the individual reported experiencing a breakup during a given phase of the study (for use in the discrete-time hazard model; 0 = together, 1 = broken up). In addition to these 20 categorical variables, the discrete-time hazard model included two additional variables, which indirectly captured the amount of time individuals had been involved with their partners. Because the amount of time that passed between each assessment varied both between and within individuals, a time-varying variable was created that captured the number of days that elapsed between each assessment (as recommended by Allison, 1995). To do this, the date of the prior assessment was subtracted from the date of the assessment under consideration. In addition to accounting for between- and within-person variation in the timing of assessments, this variable also overlaps with the amount of time individuals had been involved with their partners. To capture the amount of time

individuals had been involved with their partners but not involved in the study, another variable was created in which the date that individuals began dating their partners was subtracted from the date participants completed the baseline assessment.

Covariates

Initial Relationship Satisfaction

At the baseline assessment, individuals were asked to report on their current level of relationship satisfaction. Specifically, participants' reported agreement (on a scale from 1-9, with higher scores indicating greater agreement) with the single item "Our relationship makes me very happy" from the Investment Model scale (Rusbult, Martz, & Agnew, 1998).

Average Score of Relationship Evaluations

For each participant, the average level of positivity of relationship evaluations across the assessments was computed.

Emotional Stability

At the baseline assessment, individuals completed the 10-Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003). Individuals are asked to rate their agreement that a pair of traits applies to themselves on a scale from one to seven, with higher scores indicating greater agreement. Relevant to the current study, the scale taps an individual's level of emotional stability by asking the individual to rate his/her agreement that the two pairs of traits - "Anxious, easily upset" (reverse-scored) and

"Calm, emotionally stable"- apply to the individual. An average of the two items was computed to represent the individual's level of emotional stability, with higher scores indicating greater emotional stability. The items were correlated at .48, which is relatively low; however, this level is standard for this scale, as noted in the manuscript of the scale's origination (Gosling et al., 2003).

Amount of Time Known Original Partner

Two questions were used to determine the amount of time participants knew their partners prior to entering into a romantic relationship. During the prescreening questionnaire, participants were asked to report (a) the date that their dating relationships with their partners began, and (b) the date that participants first met their partners. To calculate the length of participants' non-romantic history with their partners, the date individuals began dating their partners was subtracted from the date that individuals first met their partners; this value was then transformed to be expressed in months (M = 19.84 months; SD = 28.42 months; range = .68–244.71 months).

OVERALL DATA ANALYSIS STRATEGY

Analyses were conducted in the following four stages: First, I derived within-person estimates of change in relationship evaluations over time using methods outlined by Wang, Hamaker, & Bergeman (2012); Second, I used a discrete time hazard model (Singer & Willett, 2003) – a longitudinal data analytic strategy that assesses whether predictors are associated with increased likelihood of reaching a criterion over time (in this case, relationship dissolution) – to replicate previous findings showing that variability leads to breakup; Third, I used a multilevel model to

test one of the primary hypotheses that greater variability of relationship evaluations predicts declines in physical health over time; Fourth, I examined whether an individual's implicit theories of relationships (destiny and growth beliefs, separately) moderate these effects. Each set of analyses is described in more detail in the following sections, preceding each set of results. All analyses were conducted using SAS version 9.3 (SAS Institute, 2002-2011).

RESULTS

OPERATIONALIZING VARIABILITY

Analytic Strategy

Previous operationalizations of variability of relationship evaluations have included the standard deviation across assessments (Campbell et al., 2010; Whitton & Whisman, 2010) or the standard error of the estimate derived from growth curve modeling (Arriaga, 2001; Arriaga et al., 2006; Whitton et al., 2014). These measures capture the amplitude of an individual's fluctuations of their relationship evaluations over time (i.e., the extent to which an evaluation score deviates from the mean or the value on a predicted linear trajectory). But recent advances in research on intra-individual variability (e.g. Ram & Gerstorf 2009; Wang et al., 2012) point out some limitations to these methods, including, for example, the inability of these previous methods to account for the heterogeneity in responses, which may be especially prevalent in dating experiences (Bolton, 1961; Huston, Surra, Fitzgerald, & Cate, 1981; Levinger, 1983), or for ceiling or floor effects that may constrain the measure of variability (Baird, Le, & Lucas, 2006). Additionally, with fewer assessments (e.g., less than 20 per individual), the reliabilities of the standard deviation or the standard error of the estimate will be lower than the reliability of the mean, which can often give the mean stronger predictive power when entering the two measures in the same model (Wang et al., 2012).

To address these shortcomings, I followed methods outlined by Wang et al.

(2012) to obtain a more nuanced measure of variability for each individual. Additionally, in line with their advice, I derived a measure of temporal dependency – the degree to which current observations are correlated with previous observations. Higher autocorrelations reflect larger degrees of temporal dependency and imply that a given deviation is likely to persist for a longer period of time compared to autocorrelations closer to zero, reflecting less temporal dependence. Importantly, two individuals can exhibit the same level of intra-individual variability yet display vastly different levels of temporal dependency (Jahng, Wood, & Trull, 2008). Specifically, an individual that displays greater variability but less temporal dependency of relationship evaluations scores over time would have a pattern of scores that switch direction greatly from assessment to assessments. Alternatively, an individual that displays greater variability and greater temporal dependency of relationship evaluation scores over time would have a pattern of longer upturns and longer downturns (e.g., a scores in the same direction at back-to-back assessments). This distinction can have important implications for individual outcomes. For example, greater variability (i.e., amplitude of fluctuations) and greater temporal dependency (i.e., longer recovery to the mean following a downturn or upturn) of emotions over time predicted worse health outcomes compared to individuals with smaller amplitudes or less temporal dependency (Wang et al., 2012). Wang and colleagues (2012) suggest researchers model both the amplitude of fluctuations and temporal dependency using first- and higher-order autoregressive processes. Accordingly, preliminary exploratory analyses were conducted in several steps, following recommendations outlined by Wang et al.

(2012), to obtain a more nuanced measure of variability and temporal dependency for the current sample.

First, I investigated if any of the participants' data needed to be detrended. Detrending is the statistical or mathematical operation of removing a trend from a data series – a necessary step to capture the intra-individual variability, above and beyond any linear or nonlinear trends, and to obtain a stationary process for later autoregressive analyses. A series of data over time is said to be *nonstationary* if it exhibits a predictable pattern, such as a linear trend. A *stationary* series of data, however, exhibits a constant mean, variance, and covariance across assessments. To check for stationarity in the original data, I first applied the commonly used augmented Dickey-Fuller test (Dickey & Fuller, 1979) to each individual time series. I also examined each individual's plot of their relationship evaluation scores across time to spot general time trends, and I tested linear regression models. Of the 202 individuals in the final sample, 72 (35.64%) showed linear trends (i.e., a general incline or decline in relationship evaluation scores over time), which were removed by subtracting a fitted straight line to each individual's time series. The augmented Dickey-Fuller test (Dickey & Fuller, 1979) was again applied to each individual's detrended time series. For each of the 72 individuals, linear detrending was sufficient to yield stationary time series, and it was not necessary to detrend the remaining individuals' time series to achieve stationarity.

Next, I used a two-stage estimation procedure to derive the estimates for

variability and temporal dependency.[8] I applied the following model to each individual time series $y_{i,t}$ where y is the level of positivity of a relationship evaluation of individual i at time t:

$$y_{i,t} = \beta_{0,i} + f_i(time_{i,t}) + e_{i,t} \quad \text{Equation 1a}$$

$$e_{i,t} = \varphi_{i,1(K)}e_{i,t-1} + \varphi_{i,2(K)}e_{i,t-2} + \ldots + \varphi_{i,K(K)}e_{i,t-K} + u_{i,t} \quad \text{Equation 1b}$$

The first equation describes how the individual repeated measures are related to time, without any consideration of an autoregressive process. The term $\beta_{0,i}$ indicates the intercept ofrelationship evaluations, which varies across individuals (note the i subscript), but is constant across time (note the lack of the t subscript). The term $f_i(time_{i,t})$ indicates any relationship, or trend, that the repeated measures could have with time; because each series is now stationary $f_i(time_{i,t})$ can be set to zero. The error terms $e_{i,t}$ represent the stationary time series for each individual i at time t. The three terms of the first equation (intercept, time trend and errors) are specific to each individual i, and

[8] It is important to note that Wang et al. (2012) discussed the use of both a two-stage estimation procedure of their method (via maximum likelihood estimation) and a one-stage estimation technique (based on Bayesian estimation). Significant differences between the two procedures should emerge only when the analyzed time series are relatively short, such that the reliability of intra-individual indices may be less than satisfactory. In such a case, the simultaneous method (i.e., Bayesian estimation) is preferred. However, the two-stage procedure has certain advantages that make it an attractive method to start with. First, it can easily be implemented with common statistical software (e.g., SAS version 9.3; SAS Institute, 2002-2011), whereas the simultaneous estimation is more complicated. Second, the two-stage procedure allows for idiosyncratic trend change and autoregressive orders, which provides estimation of the most appropriate order K of the autoregressive process for each individual, rather than forcing the order K to be the same across the whole sample (Wang et al., 2012). Thus, the two-stage model allows for more heterogeneity in the sample and was chosen for the current study.

thus allow for inter-individual differences. I then calculated the standard deviation of the residualized relationship evaluation scores for each individual, or errors ($e_{i,t}$), to obtain the detrended intra-individual amplitude of fluctuations, which represents variability.

The second equation describes the autoregressive process of the errors. That is, contrary to the assumption of independence of many statistical models (e.g., linear regression), I assumed that the errors $e_{i,t}$ may correlate in time, given that they originate from repeated assessments of the same individual. This temporal dependency is accounted for by the autoregressive coefficients $\varphi_1, \varphi_2, \ldots, \varphi_K$, where K is the order of the autoregressive process. For instance, in an autoregressive process of order $K = 1$ a lag of 1 is sufficient to account for the autocorrelation of the errors, meaning that an error at time t depends directly only on the immediately preceding error at time t-1, but not on prior errors. The final term $u_{i,t}$ indicates the component of the error at that same time point ($e_{i,t}$) that is not dependent on previous error terms. The terms $u_{i,t}$ are assumed to be centered at 0 and normally distributed. For each person, I tested multiple orders of the autoregressive process ($K = 1, 2$, etc.). The resulting autoregressive coefficients quantify temporal dependency of individuals' relationship evaluations across time and can vary across individuals both in terms of magnitude and order. In other words, whereas for some individuals an autoregressive process of order 1 might sufficiently account for the dependency of the errors, other individuals' dependency might be better accounted for by an autoregressive process of order 2 or greater. To quantify the order of each individual time series, I examined partial autocorrelation function plots as well as likelihood ratio and Akaike information criterion tests and found agreement among all tests (Akaike, 1973).

For most individuals (n = 164), an autoregressive process of order K = 1 was sufficient to account for autocorrelation of the errors; the autocorrelation in the detrended time series (composed of $e_{i,t}$) was not present after accounting for the previous measurement ($e_{i,\,t-1}$). However, some individuals showed greater levels of temporal dependency – 14 individuals' dependency was explained by an autoregressive process of order K = 2, 10 of order K = 3, and 10 of K = 4. For these individuals, their relationship evaluation scores were correlated across more than one assessment and sometimes many, indicating that they had especially long upturns or downturns. Analyses were conducted including higher order processes, but model fit indices suggested the best fit model only included the autoregressive coefficients of order K = 1. Furthermore, results did not significantly change when higher order coefficients were included; thus, for the remainder of the results, I focus on the models with only the autoregressive coefficient of order K = 1. For the remainder of the paper, the term "temporal dependency" will still be used, but it is important to note that it refers only to the level of dependency between assessments separated by only one lag.

Estimates of temporal dependency can range from -1 to 1, with scores closer to 0 indicating less temporal dependency, and scores closer to either -1 or 1 indicating greater temporal dependency in either a negative or positive direction, respectively. In other words, a temporal dependency score closer to -1 means that the individual's relationship evaluation scores on assessment (t) are negatively correlated with relationship evaluations scores on assessment (t-1), such that scores at assessment (t) tend to be even lower than scores on assessment (t-1). A temporal dependency score close to 1 means the individual's relationship evaluation scores on day (t) are positively

correlated with evaluation scores from the previous assessment, in that the second assessment is even higher than the previous one. For the purposes of the current study, the absolute value of temporal dependency scores was used as a score of the *overall* level of temporal dependency for each individual, as I am interested in the extent to which individuals' scores are dependent upon one another in general. This approach allows for an initial understanding of how the level of temporal dependency of individuals' evaluation scores can influence their relationship fate and health outcomes. Additionally, focusing on the absolute value provided more statistical power in the current set of analyses. Importantly, the two ends of temporal dependency are likely distinct and certainly warrant attention in future research, a point I address in the discussion.

Finally, I calculated the overall intra-individual average (*M*) and standard deviation (*SD*) of relationship evaluation scores across assessments for each individual, *before* detrending, to operationalize the overall level of relationship evaluations and to compute the traditional measure of variability. I computed the standard deviation of relationship evaluation scores to determine if the current study's measure of variability operated in a manner generally consistent with the traditional measure. Thus, for each individual, I obtained the overall level (mean), a measure of traditional variability in this sample (standard deviation), the level of variability (detrended standard deviation), and the temporal dependency (the autoregressive coefficients) of relationship evaluations over time. In particular, as temporal dependency is a fairly new concept to the measure of relationship evaluations over time, especially in combination with variability of those evaluations, I do not have specific, theoretically-driven predictions for how temporal dependency or the interaction of temporal dependency and variability will affect

relationship fate physical health outcomes. Thus, the examinations of temporal dependency are exploratory in nature.

Descriptive Statistics of, Stability of, and Relations Among Indices

Table 3 presents the descriptive statistics (left panel) and correlations (right panel) among the mean level of relationship evaluations, the standard deviation of relationship evaluations (i.e., one of the traditional measures of variability – Campbell et al., 2010), variability of relationship evaluations, and the autoregressive coefficient of lag1.[9] On average, individuals were satisfied with their current partners (*M* of average scores of relationship evaluations = 85.39), but they also experienced some variability across assessments (*M* of variability = 8.13; *Range:* 0 - 30.84). The individual indices of temporal dependency were on average small, indicating that temporal dependency was rather weak but in a positive direction, and the range of scores fell along a normal distribution (see Figure 1 for the distribution of temporal dependency scores).

Examination of the frequencies of levels of variability and temporal dependency revealed that seven individuals exhibited no changes in levels of relationship evaluations across all assessments and thus had scores of 0 for variability. Analyses were conducted with and without these individuals, and no significant differences emerged. Thus, these individuals were kept in all analyses.

[9] For later analyses, the absolute value of the level of temporal dependency was used. However, to provide a clearer understanding of individuals' range of temporal dependency, descriptive statistics are presented on the entire distribution of scores of temporal dependency, ranging from -1 to 1.

In the upper left side of the right panel are presented the correlations between indices. Variability was significantly and negatively correlated with mean levels of relationship evaluation scores, indicating that on average individuals that experienced greater fluctuations across assessments had lower average relationship evaluation scores. In comparing the current study's measure of variability to traditional measures (*SD*), these two measures were highly correlated ($r = .82$, $p < .001$). Interestingly, whereas no significant relationship emerged between temporal dependency and the new measure of variability, the traditional measure of variability was marginally and positively correlated with temporal dependency ($r = .11$, $p = .08$). These initial findings indicate that the two measures of variability and related but distinct.

Table 4 presents the bivariate correlations between the primary variables of interest in the current study. As can be seen, greater variability of relationship evaluations over time was associated with higher levels of self-reported health at the baseline assessment ($r = .18$, $p = .03$), greater endorsement of growth beliefs ($r = .14$, $p = .04$), marginally lower initial relationship satisfaction ($r = -.12$, $p = .06$), and lower levels of emotional stability ($r = -.20$, $p = .002$). Temporal dependency was also negatively associated with initial relationship satisfaction ($r = -.13$, $p = .04$). Most of these correlations are in line with expectations, except the positive correlation between variability and health reports at baseline. Given this unexpected finding, I also examined if the traditional measure of variability (*SD*) correlated with self-reports of physical health at baseline and found a positive significant correlation

again between variability measured in this way and reports of physical health at baseline ($r = .15$, $p = .02$).

Finally, I plotted four participants' relationship evaluation scores across the biweekly assessments (see Figure 2). The four sample plots represent prototypes of different combinations of variability and temporal dependency (i.e., high (or low) level of variability (± at least 1 SD) combined with a high (or low) level of temporal dependency (± at least 1 SD)). As can be seen in the figure, Participant A exhibits several ups and downs in relationship evaluation scores over time, yet most upturns or downturns are followed by another lower or higher score than the previous score. Participant A displays both high variability and high temporal dependency of relationship evaluation scores over time, with changes that last longer than Participant B, for example, who displays high variability but low temporal dependency. Participant B exhibits more frequent upturns and downturns of relationship evaluation scores compared to Participant A. Turning to Participants C and D, these participants exhibited less variability of their relationship evaluation scores and differing levels of temporal dependency. Whereas Participant C shows some changes that last, with a downturn that lasts more than one assessment, Participant D has a more stable pattern of relationship evaluations over time. Thus, Participant C exhibits low variability but high temporal dependency of relationship evaluation scores over time, and Participant D displays a pattern of scores that is not variable or temporally dependent. Participant D's relatively stable plot of relationship evaluation scores over time highlights an important aspect of how

temporal dependency is calculated. The equation presented earlier (Equation 1b) is not independently calculating the correlations between assessments but rather is taking into consideration the entire series to determine the manner in which deviations from the mean are followed or not by another stronger or lesser deviation. A more stable plot would have a smaller level of temporal dependency, as the scores remain close to the mean.

DOES VARIABILITY OF RELATIONSHIP EVALUATIONS PREDICT RELATIONSHIP FATE?

Analytic Strategy

Discrete-time hazard techniques were used to examine if variability predicts the probability of daters experiencing a breakup. The discrete-time hazard model is a technique for modeling longitudinal data that treats time as a series of distinct intervals. Following Singer and Willett's (2003) suggestion, a person-period dataset was created in order to conduct the discrete-time analyses. Specifically, all individuals were classified as "together" until the point in time when they either dropped out of the study (i.e., were censored) or indicated that they had broken up with their partners. All individuals for the current sample were partnered at the time they completed the baseline questionnaire in addition to the first two biweekly assessments. The actual "risk" of dissolution did not begin until the third biweekly assessment. Individuals were assigned a value of "0" for each time point their relationships remained intact, a "1" for the specific assessment in which they report having broken up with their partners, and "missing" for post-dissolution assessments. Individuals that missed one or more waves of data collection (but returned later in the study) pose a problem for

survival analysis and thus, were artificially censored at their first phase of missing data.[10]

The final model's equation was:

$$\text{logit}\, h(t_{ij}) = [\alpha_1 T_1 + \alpha_2 T_2 + \alpha_3 T_3 + \alpha_4 T_4 + \alpha_5 T_5 + \alpha_6 T_6 + \alpha_7 T_7 + \alpha_8 T_8 + \alpha_9 T_9 + \alpha_{10} T_{10} + \alpha_{11} T_{11} + \alpha_{12} T_{12} + \alpha_{13} T_{13} + \alpha_{14} T_{14} + \alpha_{15} T_{15} + \alpha_{16} T_{16} + \alpha_{17} T_{17} + \alpha_{18} T_{18} + \alpha_{19} T_{19} + \alpha_{20} T_{20}] + \beta_1 TK_i + \beta_2 TB_i + \beta_3 L_{ij} + \beta_4 S_i + \beta_5 ES_i + \beta_6 AV_i + \beta_7 SD_i + \beta_8 TD_i + \beta_9 (SD_i * TD_i)$$

Equation 2

where $h(t_{ij})$ is the probability that individual i will experience dissolution at time j (provided dissolution has not yet occurred); the α terms represent the value of the logit hazard (i.e., the intercept) for each time point T, and T corresponds to the dummy codes associated with time points 1–20—altogether, the terms in the brackets represent the baseline logit model, or the value of the logit model when all substantive predictors are set equal to zero; TK_i represents the amount of time between the start of the individuals' relationships and the first time they met their partners; TB_i is the time in days from the time the participant started dating the original partner to the date of the first baseline assessment; TL_i represents the time that passed (in days) between each assessment; S_i is the measure of the individual's initial report of

[10] Although this technique is not particularly efficient, as it does not use all available data for each participant, it does not bias the estimation of the hazard function (Bacik, 1997). It is conceivably possible to use partial censoring techniques and fill in information for missing assessments for individuals who reported remaining together at a later point in data collection; however, this approach introduces bias into estimation of the hazard function, as it can over-represent these individuals.

relationship satisfaction; ES_i represents the self-report measure of emotional stability; AV_i is the average level of positivity of relationship evaluations across assessments; SD_i and TD_i represent individual levels of variability and temporal dependency, respectively; and ($SD_i \times TD_i$) captures the interaction between variability and temporal dependency.

The overall pattern of the timing of relationship dissolution is displayed in Figure 3. Of the 202 individuals who completed the baseline and first three biweekly assessments, 5.44% (n = 11) reported experiencing a breakup with their partners at the third assessment (see Table 4 and Figure 1). An estimated 94.55% of all participants remained together with their partners after the third biweekly assessment, and 62.38% remained with their partners after the final assessment. Life table analyses indicated that among those who experienced a breakup over the course of the study, the median time to dissolution occurred after approximately 8.09 assessments (including the baseline assessment). Given that the average number of days that passed between the start of individuals' relationship and their entry into the study was 98.3 days and that an average of 16.16 days passed between each assessment, the median time to dissolution translates to approximately 7.05 months. A graph of the survival probability within the group that experienced a breakup is displayed in Figure 4.

Results

To examine whether greater variability of relationship evaluations predicts the likelihood of breakup, I tested whether individuals' levels of variability and temporal dependency (and their interaction) predicted dissolution, accounting for initial levels of relationship satisfaction, average level of relationship evaluation

scores across assessments, level of emotional stability, and the amount of time participants had known their partners prior to dating (see Table 6). Importantly, the goodness-of-fit of the full model could not be compared to that of the reduced model because these two models did not include the same number of observations (as not all individuals reported on the substantive predictors). Follow-up analyses were conducted to determine if the final (or full) model provided a better fit than the baseline model (or reduced model of only dummy coded time variables). Specifically, multiple imputation techniques were used to estimate the missing values for the predictor variables. As expected, the full model differed significantly from the baseline model, $\chi^2(10) = 228.67, p < .001$, and indicated that the full model provided the better fit. Of note, and as shown in Table 6, the parameter estimates of the likelihood of experiencing a breakup at each assessment changed direction in the final model and became negative. Follow-up analyses were conducted to investigate why the estimates would change in such a way. It was determined that including these measures of time (e.g., days between assessments, days before beginning the study, etc.) influenced the model and could potentially explain the change in direction of the sign of the estimates. However, it is still unknown why these changes might occur as a function of including these variables. One possible explanation is that the inclusion of these measures of time in addition to the number of assessment might be over-estimating the likelihood of relationship dissolution over time, as multiple measures of time are included in the model.

As shown in Table 6, several predictors significantly predicted the likelihood

of dissolution. First, though not directly relevant to the current study, for individuals who had started dating their partners a day prior to study participation, the estimated odds of dissolution were slightly more than 1% (1.02%) lower at each assessment compared to a hypothetical individual that started dating their partner the same day as participation in the study. Although this difference in the odds of dissolution seems insubstantial when time is treated in such a small increment, its import becomes more pronounced when time is measured in larger units. For example, individuals who started dating their partners a month prior to participation in the study experienced a 30.01% lower risk of dissolution compared again to the hypothetical individual that started dating their partner the same day as study participation. Additionally, more time between assessments also predicted likelihood of dissolution, such that an individual who completed the assessment a day late (i.e., 15 days between assessments) was 3.12% more likely to break-up with their partner at each assessment than an individual who completed their assessments on time. Furthermore, as would be expected, higher average relationship evaluation scores across assessments predicted decreased likelihood of dissolution. Specifically, with each unit increase in mean level of relationship evaluations, individuals' risk of experiencing a breakup was 6.32% lower at each assessment compared to individuals with lower levels of relationship evaluation scores.

Turning to the primary predictors of interest, greater variability and greater temporal dependency of relationship evaluations predicted increased likelihood of breakup. Specifically, for each one-unit increase in individuals' level of variability,

the estimated odds of dissolution at each assessment were 1% (1.07%) higher than those for individuals with more stable relationship evaluations. The survival function (i.e., the probability that an individual will be partnered at each wave of data collection) is plotted in Figure 5 as a function of three levels of variability – one standard deviation below the mean, the mean level, and one standard deviation above the mean. Individuals with greater levels of temporal dependency also experienced an increased likelihood of relationship dissolution at each assessment, such that increases in temporal dependency were associated with 8% (7.71%) increased likelihood of dissolution at each assessment. This finding indicates that individuals with temporal dependency levels closer to 1 were experiencing the dissolution of their relationship at an 8% faster rate at each assessment, compared to individuals with less temporal dependency of their relationship evaluation scores. Across multiple assessment, such as four or more, these percentages become increasingly higher and suggest the individual with higher levels of temporal dependency is up to 30% more likely to breakup with their partner by the fourth assessment.

The interaction of variability and temporal dependency was not a significant predictor of relationship fate. These findings remained significant with or without the covariates (i.e., initial relationship satisfaction, average level of relationship evaluations scores across assessments, emotional stability, time known the partner prior to the study), indicating that these effects of variability and temporal dependency are unlikely to be artifacts of individual differences or other aspects of

the relationship and uniquely contribute to relationship fate.

DOES VARIABILITY OF RELATIONSHIP EVALUATIONS PREDICT CHANGES IN PHYSICAL HEALTH OVER TIME?

Analytic Strategy

I next tested the hypothesis that variability of relationship evaluations will predict declines in physical health over time. To answer this question, I used growth curve modeling techniques to test the following model:

Level 1:

$$Y_{ij} = \beta_{0j} + \beta_{1j}(\text{time}_{ij}) + r_{ij}$$

Equation 3a

Level 2:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{initial relationship satisfaction}) + \gamma_{02}(\text{mean level of relationship evaluations}) + \gamma_{03}(\text{variability of relationship evaluations}) + \gamma_{04}(\text{temporal dependency of order1})$$

$$\beta_{1j} = \gamma_{10} + \gamma_{11}(\text{initial relationship satisfaction}) + \gamma_{12}(\text{mean level of relationship evaluations}) + \gamma_{13}(\text{variability of relationship evaluations}) + \gamma_{14}(\text{temporal dependency of order1})$$

Equations 3b-c

In these equations, the outcome *Y* is an individual's physical health, and *i* indexes the time point and *j* indexes the individual. Time was operationalized as the individual's relationship length and was group mean centered, so that the intercept (β_{0j}) represents the average level of physical health over time within each individual. Initial relationship

satisfaction, mean level of relationship evaluations, variability of relationship evaluations, and temporal dependency are included in both the Level 2 equation predicting the intercept, or individuals' average levels of physical health, and the Level 2 equation predicting the slope over time in levels of physical health. The coefficients γ_{04} and γ_{14} test the primary hypothesis, as they represent the effects of fluctuations in relationship evaluations on average levels and slopes of physical health, controlling for initial level, mean level, and temporal dependency of relationship evaluations.

Results

As can be seen in Table 7, none of the parameters were associated with *linear* changes in self-reports of physical health over time. However, several measures of changes of relationship evaluation scores over time predicted *average* levels of physical health – though not all in expected directions. First, as would be expected, higher *average* levels of physical health (indicating higher levels of functioning) were associated with higher average scores of relationship evaluations, $\beta = .005$, $SE = .002$, $t(200) = 2.22$, $p = .02$. However, contrary to expectations, higher average levels of physical health were also associated with greater variability, $\beta = .01$, $SE = .005$, $t(200) = 2.22$, $p = .04$, and significantly associated with greater temporal dependency of relationship evaluations across assessments, $\beta = .17$, $SE = .07$, $t(200) = 2.46$, $p = .01$. The interaction of variability and temporal dependency was also a significant predictor of average levels of physical health, $\beta = .02$, $SE = .01$, $t(200) = 2.06$, $p = .03$. All effect sizes were relatively low (<.20).

The interaction of variability and temporal dependency on average physical health was examined more closely using procedures outlined by Aiken and West (1991) for two continuous variables, with comparisons made at 1 SD from the mean. Figure 6 portrays the overall pattern of results. Out of four possible simple slopes, two emerged as significant (see Table 8). Specifically, individuals who exhibited greater variability of relationship evaluations reported higher average health levels if they also exhibited high temporal dependency across their relationship evaluations, $\beta = .30$, $SE = .09$, $t(200) = 3.21$, $p = .002$, compared to individuals with greater variability and less temporal dependency of relationship evaluations. Furthermore, of individuals that exhibited high levels of temporal dependency, greater variability was associated with higher average levels of self-reported health, $\beta = .02$, $SE = .01$, $t(200) = 2.67$, $p = .03$.

Because greater variability was found to potentially be associated with *better* health outcomes (counter to hypotheses), follow-up analyses were conducted to examine the model more carefully. For example, one potential reason for the significant, positive association between variability and average levels of self-reported health as well as non-significant associations with linear change in health may be that for individuals who experienced a breakup during the study, their final health assessment occurs immediately following their breakup. It is plausible that for individuals who fluctuate considerably in their feelings about their partners while their relationships are intact, the dissolution of the relationship actually provides some relief and subsequently leads individuals to experience a boost in

health following break-up. Thus, I conducted analyses that omitted the final assessment of health for individuals who experienced a break-up. The pattern of results was similar in this new analysis (and is portrayed in Table 9), such that the level of *average physical health* across assessments was predicted by greater variability of relationship evaluations, $\beta = .01$, $SE = .005$, $t(200) = 2.80$, $p = .01$, greater temporal dependency of those evaluations, $\beta = .03$, $SE = .07$, $t(200) = 2.75$, $p = .01$, and the interaction of variability and temporal dependency, $\beta = .03$, $SE = .01$, $t(200) = 2.80$, $p = .004$.

Again, neither variability nor temporal dependency exerted main effects on *changes* in physical health over time; however, the interaction emerged as a marginal predictor, $\beta = .004$, $SE = .002$, $t(200) = 1.74$, $p = .08$. This interaction was examined more thoroughly using procedures outlined by Aiken and West (1991) and graphed in Figure 7. Analyses revealed that three of the simple slope effects were significant, the results of which are outlined in Table 10. Specifically, when individuals exhibited greater variability, they experienced more declines in physical health over time when they also exhibited low levels of temporal dependency, $\beta = .20$, $SE = .07$, $t(200) = 2.80$, $p = .005$, compared to individuals with high variability and high levels of temporal dependency. Moreover, for individuals that exhibited low levels of variability, if they also exhibited high temporal dependency, they experienced more declines in physical health over time compared to individuals with low levels of both variability and temporal dependency, $\beta = -.19$, $SE = .07$, $t(200) = -2.74$, $p = .004$. Finally, of those that

exhibited higher levels of temporal dependency, greater variability was associated with fewer declines in physical health over time compared to individuals with lower variability, $\beta = .01$ $SE = .004$, $t(200) = 2.91$, $p = .002$. These effects were modest in size (<.20) but suggest the final assessment of health for those that experienced a breakup may alter the findings.

I next assessed the individual health items to determine if differences might emerge between these questions. Specifically, one item taps current health conditions, whereas the second item asks participants to report any changes in physical health over the last two weeks. I conducted these analyses both including and excluding the final assessment of health for the individuals who experienced a breakup. The patterns were not different from one another, and thus, I report the results from the full dataset. First, in predicting average levels of self-reported current health (the first item), neither variability nor temporal dependency exerted main effects, but the interaction of these two items did significantly predict higher average levels of current health across assessments, $\beta = .05$, $SE = .02$, $t(200) = 2.47$, $p = .01$. Simple slope analyses were conducted to examine this interaction more thoroughly. Out of the four potential simple slopes, two emerged as significant – similar to those in the analyses predicting the average of both health items. Specifically, individuals with greater levels of temporal dependency and more variable relationship evaluations over time experienced higher average levels of self-reported health (item one only) levels over time compared to individuals with more stable relationship evaluations, $\beta = .02$, $SE = .01$, $t(200) = 2.51$, $p = .01$

Additionally, individuals who exhibited greater variability of relationship evaluations but less temporal dependency of those evaluations (i.e., they switched back and forth between positive and negative more frequently) experienced lower levels of physical health compared to individuals with greater variability but more temporal dependency of those evaluations, $\beta = .50$, $SE = .16$, $t(200) = 3.16$, $p = .002$. No significant effects emerged in predicted changes over time in this health item.

In predicting the second health item (self-report changes in physical health since last assessment; the second item), variability emerged as a significant predictor, such that greater variability of relationship evaluations was associated with higher average levels of self-reported health improvements, $\beta = .01$, $SE = .004$, $t(200) = 2.63$, $p = .01$. Temporal dependency had a similar effect on average levels of this item, such that greater temporal dependency predicted higher levels of self-reported changes in physical health as well, $\beta = .13$, $SE = .06$, $t(200) = 2.11$, $p = .04$. The interaction of variability and temporal dependency did not predict average levels of the second item, and no significant effects emerged in predicting changes in this item. The results of these analyses suggest that participants may answer these questions slightly differently, but the overall pattern of results is similar for both items.

I also examined the model using the traditional measure of variability (the standard deviation of relationship evaluation scores across assessments; e.g., Campbell et al., 2010). Results were marginally significant and in a similar

direction as the measure used in the current study. Specifically, greater variability (measured by the traditional standard deviation), was associated with higher levels of self-reported physical health across assessments, although this model failed to reach conventional levels of statistical significance, $\beta = .01$, $SE = .004$, $t(200) = 1.66$, $p = .09$.

In sum, variability of relationship evaluations had an unexpected but modest effect on physical health, such that greater variability was associated with higher average levels of self-reported physical health over time. However, an interaction emerged, such that greater variability was associated with higher average levels of self-reported health when this variability was coupled with higher levels of temporal dependency compared to individuals with high variability but lower temporal dependency. These findings were consistent in models with or without covariates. As slight differences emerged in the dataset excluding the final health assessment for those who experienced a breakup, I conducted the following analyses on both datasets. However, the results did not differ; thus, in the following section, I present the results from the full dataset.

Do Implicit Theories of Relationships Moderate the Associations between Variability and Relationship Fate and Health?

Predicting Relationship Fate

I predicted that greater endorsement of destiny beliefs would exacerbate the links between variability and relationship fate and that greater endorsement of growth beliefs would buffer individuals from these links. To test this hypothesis, I entered destiny beliefs and growth beliefs (separately) and their interactions with each of the estimates of individuals' relationship evaluations in Equation 2. After

testing the two-way interactions of variability and destiny and growth beliefs, respectively, I also tested the three-way interaction of variability and destiny and growth beliefs.

Results for the model including destiny beliefs are displayed in Table 11, and results for the model including growth beliefs are displayed in Table 12. Destiny beliefs did not predict relationship fate, $\beta = .68$, $SE = .82$, $\chi^2 = .69$, $p = .41$. The interaction of destiny and variability on likelihood of breaking up was also not significant, $\beta = .001$, $SE = .01$, $\chi^2 = .02$, $p = .90$, nor was the interaction of destiny with any of the measures of individuals' relationship evaluations. Growth beliefs also did not predict relationship status, $\beta = -.74$, $SE = 1.15$, $\chi^2 = .41$, $p = .52$, and the interaction of growth with variability did not predict relationship status, $\beta = -.04$, SE = .02, $\chi^2 = 2.52$, p = .11, nor did the interaction of growth beliefs with any of the measures of individuals' relationship evaluations. Finally, the three-way interaction of growth, destiny, and variability did not significantly predict relationship fate, $\beta = -.002$, $SE = .01$, $\chi^2 = .02$, $p = .89$. In sum, destiny and growth beliefs did not appear to moderate the effects of fluctuating relationship evaluations on relationship fate.

Predicting Physical Health Outcomes

Recall that I hypothesized that greater variability of relationship evaluations would be associated with declines in physical health over time and that this association would be moderated by individuals' implicit theories of relationships.

However, the previous set of analyses suggests that a possible positive association exists between variability and physical health outcomes, such that greater variability is associated with higher average levels of health over time and not associated with changes in self-reports of physical health over time. It is still possible that individual differences moderate these effects, particularly of those predicting average levels of self-reported physical health. But if so, it is likely that these interactions do not have the same predicted effects on health outcomes. For example, rather than the predicted exacerbating effect of higher destiny beliefs on the association between variability and health outcomes (i.e., that individuals with higher destiny beliefs that also exhibit greater variability will be especially likely to experience health detriments compared to those with lower destiny beliefs), it may instead be that destiny beliefs attenuate the association variability and health outcomes. In this case, individuals who more strongly endorse destiny beliefs and experience greater variability of relationship evaluations do experience lower average self-report physical health levels over time. Alternatively, individuals who more strongly endorse growth beliefs may thrive off the ups and downs associated with variable relationship evaluations. These hypotheses are similar in that they support the idea that of those who fluctuate more, individuals with stronger growth beliefs should experience better health outcomes compared to individuals with less strong growth beliefs and individuals with stronger destiny beliefs should experience worse health outcomes compared to individuals with less strong destiny beliefs. However, they are different than the original set of hypotheses in that the direction of physical

health as a function of variability is opposite.

The analyses did not change for these post-hoc hypotheses. Individuals' level of endorsement of growth beliefs and their level of endorsement of destiny beliefs as well as their interactions with each measure of individuals' relationship evaluations were entered at the between-subjects level of analysis (Equation 3b-c) separately to predict both the intercept and the slope of physical health over time. The results are displayed in Tables 11 and 12. The main effect of destiny beliefs was not a significant predictor of health outcomes, β (average levels of health) = .02, SE = .02, $t(200)$ = .12, p = .67, B (changes over time in health) = .002, SE = .002, $t(200)$ = .93, p = .50, and the interaction of level of endorsement of destiny beliefs and variability did not significantly predict average levels of or changes in physical health over time, β = .001, SE = .003, $t(200)$ = .46, p = .45 and β = -.001, SE = .001, $t(200)$ = -1.26, p = .87, respectively. However, two unexpected interactions did emerge as marginal predictors of health outcomes. First, the interaction between destiny beliefs and initial relationship satisfaction marginally predicted average levels of health, β = .03, SE = .02, $t(200)$ = 1.93, p = .05. This interaction is displayed in Figure 8. Simple slope analyses revealed one marginal effect, such that individuals with greater variability also reported higher levels of health on average to the extent that they also were highly satisfied with their relationship at the start of the study, β = .08, SE = .04, $t(200)$ = 1.81, p = .07. Second, the interaction between destiny beliefs and average relationship satisfaction marginally predicted changes in physical health over time, β = -.001, SE = .002,

$t(200) = -1.75$, $p = .08$. However, simple slope analyses revealed no significant slope effects.

No significant main effects emerged with growth beliefs in predicting average levels of or changes in physical health over time, $\beta = .02$, $SE = .02$, $t(200) = .82$, $\beta = .32$, and $\beta = -.003$, $SE = .003$, $t(200) = -.94$, $p = .67$, respectively. Furthermore, the interaction of growth beliefs and variability did not predict average levels of physical health, $\beta = .002$, $SE = .004$, $t(200) = .40$, $p = .43$, or changes in physical health over time, $\beta = -.001$, $SE = .001$, $t(200) = -.74$, p = .36. One unexpected interaction emerged as marginally significant; specifically, initial levels of relationship satisfaction and growth beliefs interacted to predict changes in physical health, $\beta = -.01$, $SE = .004$, $t(200) = -1.86$, $p = .06$. Simple slope effects were not significant, however.

The three-way interaction between growth beliefs, destiny beliefs, and variability of relationship evaluations was not a significant predictor of health outcomes.

DISCUSSION

In the current study, I examined whether greater variability of relationship evaluations over time was associated with relationship fate and physical health outcomes, and if these associations were moderated by individuals' implicit theories of relationships. To test these ideas, I conducted a series of analyses on data collected from a sample of newly-dating individuals who reported their relationship evaluations and levels of physical health biweekly up to 20 times over the course of approximately a nine month period. To do this, I first explored the pattern of each individual's relationship evaluations over time, and derived detrended estimates of within-person change of relationship evaluations to be used in subsequent analyses. Next, I tested whether these measures, specifically variability, predicted increased likelihood of relationship dissolution as well as declines in physical health over time. The overall pattern of results was mixed, with greater variability of relationship evaluations predicting increased likelihood of relationship dissolution yet also predicting higher average levels of self-reported physical health across assessments and no significant associations with changes in self-reported physical health over time. Furthermore, a previously understudied measure of intra-individual change of relationship evaluations over time – temporal dependency – was explored and was also associated with relationship fate and health outcomes. However, significant interactions emerged between these variability and temporal dependency and suggest that they may work in conjunction to predict outcomes. In the following discussion, I review these findings in more detail and provide a possible rationale for the results.

VARIABILITY AND RELATIONSHIP FATE

Replicating previous findings (e.g., Arriaga, 2001), greater variability

(measured as the detrended standard deviation of the residuals) of relationship evaluations over time was associated with an increased likelihood of relationship dissolution, above and beyond mean levels or initial levels of relationship evaluation scores. Furthermore, this finding was consistent when adjusting for the time the individual had known his/her original partner prior to dating as well as the level of self-reported emotional stability of the individual. Thus, the novel measure of variability for the current study appears to be operating in a similar manner as traditional measures of variability, yet may provide a more reliable estimate of variability. The reliability of the current study's measure of variability was .85, compared to a reliability of .64 for the traditional measure.

Interestingly, temporal dependency also significantly predicted an increased likelihood of relationship dissolution, such that individuals with higher levels of temporal dependency (i.e., their relationship evaluation scores at each assessment were dependent on the scores at the previous assessment) were at an increased risk of experiencing the dissolution of their relationship. Temporal dependency is a relatively novel statistical measure of intra-individual change of relationship evaluations over time, and future research is needed to delineate these effects more thoroughly. As the absolute value of temporal dependency was used for the current study, differences may exist between individuals with positive dependencies versus negative dependencies – a possibility I review in more detail as a future direction.

VARIABILITY AND PHYSICAL HEALTH

The second aim of the study was to examine if greater variability of relationship evaluations would be associated with declines in self-reported physical health over time. Self-reports of relationship quality have been strongly tied to physical health outcomes (e.g., Holt-Lunstd et al., 2008; House, Landis, & Umberson, 1988), yet no study to date has examined the association of physical health and the extent to which these relationship evaluations fluctuate over time. However, several lines of research suggest an association may exist, given that greater variability of relationship evaluations over time may signal violation of individuals' need for consistency in and control over their own outcomes (Baumeister & Leary, 1995; Murray, 1999). For example, greater variability is associated with increased relational uncertainty (Whitton et al., 2014), which may undermine individuals' feelings that they control their own outcomes (Abramson et al., 1978) – a lack of which is a defining feature of increased levels of perceived stress and leads to poorer physical health outcomes (Cohen, Kamarck, & Marmelstein, 1983; Krantz, Whittaker, & Sheps, 2011).

Despite the previous research to support this hypothesis, current results indicated that variability of relationship evaluations has a more complex association with health outcomes than anticipated. First, in regards to the primary hypothesis, greater variability of relationship evaluations did not exert a main effect on *changes* in physical health over time. In fact, only one significant effect on changes in self-reported physical health over time emerged, and this effect was only present when

the final assessment of health was removed for individuals who experienced a breakup (as this assessment occurred post-breakup). Specifically, an interaction between variability and temporal dependency of relationship evaluations emerged as marginally significant. Analyses of simple effects revealed that greater variability of relationship evaluations was associated with greater declines in self-reported physical health over time when those evaluations were *not* very temporally dependent (for an example, see Participant B on Figure 2), whereas greater variability with greater temporal dependency (see Participant A, Figure 2) was associated with less declines (nearly zero) in self-reported physical health over time. In other words, individuals with evaluations that switched direction from assessment to assessment (i.e., higher, then lower, then higher, etc.) more frequently experienced declines in physical health over time, compared to individuals who fluctuated but had longer lows and highs (i.e., remained higher or lower for a longer period of time). This finding, though mostly exploratory with the inclusion of temporal dependency, is in line with previous theories of variability. Specifically, greater variability of relationship evaluations should consist of constant shifts between positive and negative feelings about the partner (Kelley, 1983a), which may be better captured by an individual with low temporal dependency but high variability. These individuals have uncorrelated relationship evaluations from assessment to assessment that are also changing greatly between assessments and thus, may be especially likely to feel a lack of control or predictability over the relationship's fate. An individual with greater variability but high temporal

dependency may feel a greater sense of stability within the relationship, as that individual may actually be taking the time to experience and process the relationship events that may have prompted a change in evaluation scores. When a change in relationship evaluation scores (i.e., a large switch from a higher score to a lower score or vice versa), individuals with greater temporal dependency of their scores may be noticing this change and might be more likely to take the necessary steps to maintain the upturn or process the downturn in order to avoid it in the future.

Alternatively, of those individuals who exhibited higher levels of temporal dependency, greater variability of relationship evaluations across time was associated with less declines in physical health over time compared to individuals with less variable but still temporally dependent relationship evaluations. Individuals with less variability but high temporal dependency (for a reference, see Participant C) do not switch back and forth between positive and negative feelings about the relationship. However, if they experience a change in relationship evaluation score, they are likely to experience it for a longer period of time and may stabilize but might not return to the mean again. It is important to note, however, that these findings do not take into account the direction of temporal dependency for each individual. Raw scores of temporal dependency could range between -1 and 1, with scores closer to -1 and 1 indicating a negative autocorrelation and a positive autocorrelation respectively. For the purposes of the current study, I was interested in absolute dependency levels between assessments, as these analyses were the first

step in understanding how temporal dependency of relationship evaluations might affect outcomes, and I wanted to explore how generally dependent changes in evaluation scores over time were for individuals. An individual with more temporally dependent relationship evaluation scores might feel a sense of stability of those changes over time. In other words, given previous experiences with the partner, an individual might feel more certainty regarding how long the downturn or upturn will last. In happy times, this individual can feel more assured that a happy time is ahead. Alternatively, when this individual feels distressed in the relationship, she or he might be more motivated to address the issue with the knowledge that these feelings may last for the time being. Examining differences in the directions of dependency is part of my intended future directions for this research.

Second, greater variability of and greater temporal dependency of relationship evaluations across time were both associated with higher average levels of self-reported physical health. The interaction of variability and temporal dependency of relationship evaluations also significantly predicted average levels of physical health. Specifically, individuals who exhibited greater variability and greater temporal dependency also reported higher average levels of physical health compared to individuals with greater variability of and less temporal dependency of relationship evaluations over time. Additionally, for individuals with high levels of temporal dependency, if they exhibited less variable relationship evaluations, they experienced steeper declines in physical health over time compared to individuals with high levels of both variability and temporal dependency. These findings reflect

a similar pattern to those predicting changes in physical health over time, in that greater variability coupled with greater temporal dependency is associated with better outcomes than greater variability with lower temporal dependency or greater temporal dependency with more stable relationship evaluations.

These findings were consistent across several exploratory analyses. For example, I examined if outliers might be driving the effect by removing individuals from the analysis with variability levels over three standard deviations above the mean. Also, I used the traditional operationalization of variability (the standard deviation across assessments) to predict changes in physical health. Each of these analyses revealed similar patterns to the original findings, suggesting these effects are somewhat robust within this sample.

TESTING THE ROLE OF DESTINY AND GROWTH BELIEFS AS MODERATORS

The final aim of the current study was to examine the role of potential moderators – individuals' implicit theories of relationships. Previous research on romantic relationships has shown that individuals' general beliefs about how relationships operate often moderate the associations between various relationship and individual outcomes. For example, growth beliefs buffer individuals from the association between negative relationship experiences and reduced commitment levels (Knee et al., 2004), and destiny beliefs exacerbate the effects of discrepancies between ideal and actual partners and subsequent relationship satisfaction and longevity (Knee, 1998). In predicting individual outcomes, growth beliefs buffer

individuals from experiencing the negative effects that often follow a discussion of discrepant relationship views (Knee et al., 2001) and actually are associated with increased levels of happiness and decreased depressive feelings following such discussions. Alternatively, destiny beliefs exacerbate the association between these discussions and subsequent emotional well-being, in that individuals with higher destiny beliefs tend to feel increased hostility following the discussions. Together, these findings suggest that individuals may experience and interpret their relationships in different ways depending on their general beliefs about relationships. In the current study, I predicted that destiny and growth beliefs (separately) would interact with variability to predict relationship fate and changes in self-reported physical health over time, such that growth beliefs would buffer individuals from the negative effects of variability and destiny beliefs would exacerbate these effects.

In predicting relationship fate, neither destiny beliefs nor growth beliefs (or their interaction) were significant moderators of its associations with variability or temporal dependency. These interactions also did not predict average levels of or changes in self-reported physical health across assessments. It is surprising that no significant findings emerged in predicting relationship fate from an interaction of destiny beliefs with one of the measures of relationship evaluations (initial relationship satisfaction), as previous findings have shown a significant interaction between destiny beliefs and initial relationship satisfaction on subsequent relationship longevity (Knee, 1998). One possibility for the lack of findings with

growth and destiny beliefs in this sample is that interactions are often hard to find – particularly with smaller sample sizes. Alternatively, these individuals could still be forming their relationship beliefs, as the sample was relatively young (*Range*: 18-25 years old), and they may be experiencing new types of relationships that alter their views.

In predicting average levels of and changes in health from the interactions of growth and destiny beliefs with variability (separately), I had to adjust my hypotheses. Specifically, whereas for one of the original hypotheses I predicted an exacerbating effect of destiny beliefs (i.e., that individuals who fluctuate more and more strongly endorse destiny beliefs may experience worse health outcomes than others with more stable evaluations or lower destiny beliefs), the new hypothesis was that destiny beliefs would dampen the health benefits of variable relationship evaluations. Furthermore, whereas for the second hypothesis I originally predicted that growth beliefs would buffer individuals from the effects of variability on physical health over time, the new hypothesis was that higher growth beliefs may enhance the effects of variability on physical health (i.e., that individuals who more strongly endorse growth beliefs and fluctuate in their feelings about their partner experience especially strong health benefits, compared to individuals with lower growth beliefs or less variable relationship evaluations). These hypotheses are different from the original hypotheses in the direction of the effects, yet they are similar in that the underlying theories are still that higher destiny beliefs coupled with greater variability of relationship evaluations will be associated with worse

health outcomes compared to those with lower destiny beliefs or more stable relationship evaluations and that higher growth beliefs coupled with greater variability of relationship evaluations will be associated with better health outcomes compared to those with lower growth beliefs or more stable relationship evaluations.

The analyses including destiny and growth beliefs and their interactions did not reveal many significant effects. Only one marginal effect emerged that also had a marginal simple slope effect. Specifically, individuals with higher destiny beliefs and higher initial levels of relationship satisfaction had marginally higher average levels of self-reported physical health compared to individuals with higher destiny beliefs but lower initial relationship satisfaction. This unexpected effect provides a link to how destiny beliefs may interact with relationship factors to predict health outcomes.

IMPLICATIONS

Before discussing the potential implications of the findings connecting variability to better overall health outcomes, a number of characteristics of the current study's methods need to be addressed that could account for the positive association between variability and better overall physical health. First, the measures of physical health outcomes for the current study relied on self-reports of physical health and may not have accurately represented the underlying physiological stress related to fluctuating relationship evaluations. A more powerful

study of the links between variability and physical health outcomes might be to use physiological markers (e.g., heart rate, blood pressure, skin conductance, hormone levels), as physical health changes may not be large enough over this amount of time (e.g., less than ten months) for individuals to notice and report in such broad questions as were used in the current study. Second, significant differences were present between the sample used for the current study and those excluded in that individuals who were excluded from the final sample were more likely to evaluate their relationship less positively and more likely to experience a breakup than those included. Thus, these findings may not be generalizable beyond this sample. Third, a linear effect did not emerge, which would provide some indication that a causal relationship exists between variability and self-reported physical health. Thus, it may not be the case that more variable individuals experience health benefits from their fluctuating, and it could be that healthier individuals (or at least individuals that perceive themselves to be) tend to fluctuate more in how they feel about their partners – still contrary to what I would have originally predicted. Despite these qualifications, the significant results suggest the links between variability and health outcomes need to be thoroughly explored.

One potential explanation for the association between variability and physical health outcomes is that fluctuating relationship evaluations over time may not be that damaging – at least not physically. Rather, this variability may benefit individuals by encouraging them to exit a relationship that is causing shifting perceptions of the relationship. Recent lines of research have shown that processes known to be "adaptive"

may, under certain circumstances, not protect individuals from relationship issues and instead fuel them. For example, in a study of newlywed couples, greater forgiveness, traditionally presumed to be a positive relationship quality, only predicted positive marital outcomes when the partner rarely engaged in negative relationship behavior. If spouses had partners who frequently engaged in negative behavior, forgiving those transgressions actually led to steeper declines in satisfaction over the first two years of marriage (McNulty, 2008). In a similar vein, variability of relationship evaluations may actually alert individuals to problems needing attention rather than allowing these issues to slip under the rug and fester over time. In other words, individuals with more variable relationship evaluations might actually be more in tune with the relationship and better able to either work on the relationship or move on from a relationship that is causing too much distress.

STRENGTHS AND LIMITATIONS

The current study's results should be considered with the following limitations in mind. First, I could only include individuals with at least three biweekly assessments (a total of four assessments including the baseline). Thus, I had to drop about 20% of the original sample. However, these individuals may not have had relationships that lasted long enough to see effects emerge. Second, another potential limitation of the current study is the relative homogeneity of the sample. Most of the participants for the current sample were young, White, well-educated, and lived in a relatively affluent urban area, and these demographic factors can strongly influence relationship stability (e.g., White, 1990). It would be useful to examine whether the pattern of results from the current study also emerge

within a more culturally diverse sample. Third, the method of calculating the intra-individual indices of change of relationship evaluation scores over time is somewhat is subjective in nature when performed by one researcher. I examined each individual's plot and performed analyses on each individual's data series, making judgments based on spot-checking graphs and model fit indices. Although I followed the guidelines of Wang and colleagues (2012) and used the same criteria for determining patterns, the lack of exact qualifications for certain decisions leaves room for errors. Future work should examine inter-rater reliabilities of decisions made between two researchers working on the study. Fourth, the current study is limited by the correlational nature of the data, rendering any causal inferences of the data unconfirmed at this point.

These limitations of the current study are balanced by a number of strengths. Foremost among these strengths is the use of individual-level analysis to derive within-person estimates of change over time, using methods outlined by Wang et al., 2012. Specifically, the measure of variability of relationship evaluations for the current study (the de-trended standard deviation of the residuals) is a more nuanced way of capturing within-person fluctuations over time in relationship evaluation scores and involves close and careful calculation of these indices. Furthermore, the measure of variability used in the current study addresses limitations outlined by previous researchers, most notably by providing a more reliable and more individualized measure of variability. Capturing the extent to which an individual deviates from an expected norm for their relationship evaluations over time poses several issues for researchers, as determining the "norm" for

a given individual's relationship may depend on many factors and may not be accurately determined without examining the individual's scores alone (and not looking at trends across many individuals). In other words, not all individuals may exhibit a linear trend in their relationship evaluations over time during the early phases of a relationship. Rather, and as this study would also suggest, many individuals may not exhibit a predictable pattern at all during the first several months of their relationship. Thus, taking a truly intra-individual approach may strengthen calculation of intra-individual indices, such as variability. Additional strengths include the use of a longitudinal sampling design, with up to twenty assessments per individual over nine months, as well as the examination of early-stage relationships. Finally, the inclusion of a measure of temporal dependency is novel and may provide additional information regarding how individuals experience and evaluate their relationships and how the dependency between assessments of those evaluations may influence the individual and the relationship.

FUTURE DIRECTIONS

This research serves as a springboard for several future directions. First, analyses need to be conducted to determine if relationship status (i.e., if the individual experienced a breakup or not) moderates the associations between variability and health outcomes, as individuals who leave a turbulent relationship may report better physical health than individuals who remain in one. Along these same lines, it would be interesting to examine if differences emerge in who initiates the dissolution of the relationship. Individuals with more variable relationship

evaluations that also initiate the breakup may be able to realize their current partners are not the best fit and might provide a protective distance from any difficult health outcomes related to their variable relationship evaluations, compared to individuals with more variable relationship evaluations who are actually broken up with. Previous research (e.g., Arriaga, 2001) did not find differences in relationship outcomes associated with variability between those who chose to break up with their current partners and those that were broken up with; however, differences might emerge in individuals' physical health outcomes, as being able to feel some control over their relationships' outcomes and therefore their own outcomes by initiating the breakup could lead individuals to report better physical health compared to individuals who may have experienced their breakup unexpectedly or may feel that they did not have a say in the change of relationship status.

Second, future research should explore both the degrees of temporal dependency and the varying directions of the magnitude of temporal dependency. In the current study, I only included individuals' level of temporal dependency at the first lag (i.e., the extent to which one assessment's evaluation score is correlated with the most recent previous assessment's evaluation score), and I computed the absolute value of those scores. This focus does not allow for as much heterogeneity in individuals' patterns of relationship evaluation scores over time. Thus, in the next steps, further degrees of temporal dependency (i.e., at lags 2, 3, 4, etc.) should be considered, as a substantial portion (18.81%) of the current sample exhibited degrees of temporal dependency higher than only at lag 1. In addition, the direction

of temporal dependency of an individual's relationship evaluations might influence relationship fate and health outcomes in different ways. Specifically, individuals whose relationship evaluation scores take longer to return to their mean level of evaluation scores following a *downturn* should be more likely to experience the dissolution of their relationships compared to individuals whose relationship evaluation scores exhibit a positive direction of temporal dependency (i.e., their scores take longer to return to the mean level following an *upturn*). Future work should include indices of both the level of temporal dependency (i.e., to lags 2 or more) as well as the direction of dependency (i.e., negative or positive).

Third and related, another consideration worthy of future research endeavors involves a more careful examination of the idea of "variable relationship evaluation scores". In particular, it would be useful to investigate if downturns or upturns in evaluation scores have different effects on likelihood of breaking up and/or physical health experiences. As mentioned in the introduction of the study, these upturns may symbolize an exciting new discovery about the partner that solidifies individuals' commitment to and satisfaction with their relationships, whereas downturns should signal relationship trouble that may be evaluated as a significant and potentially unresolvable issue. Given the different valence of these experiences in relationship evaluations, upturns and downturns may have different health effects. For example, an individual with larger upturns and smaller downturns might have more positive relationship experiences, and thus, be less likely to break up with the partner and experience any health effects, compared to an individual with

larger downturns. Differences in levels of upturns and downturns might also account for the surprising health finding – that individuals with greater levels of variability of their relationship evaluation scores report higher levels of physical health. This issue in capturing intra-individual variability within a single measure has yet to be resolved, and the measure used in the current sample does not take into consideration the direction of change (i.e., in a positive or negative direction). However, previous researchers (e.g., Arriaga, 2001; Whitton et al., 2014) have examined individuals' trajectories by plotting them and counting the number of downturns versus upturns to include these numbers in analyses.

Fourth, an interesting next step of future research in this field would be to examine more specific health behaviors reported by individuals. In the current study, I did not find a significant association between greater variability of relationship evaluation scores over time and declines in physical health over time. In fact, as previously mentioned, a significant *positive* association between greater variability of relationship evaluation scores and average self-reported physical health scores emerged, suggesting that, if anything, variability is associated with better physical health functioning. These findings may be limited, however, in the broad nature of the self-report question. More specific indicators of healthy functioning (e.g., alcoholic drinking behavior, sleeping habits) may provide a more nuanced understanding of how variable relationship evaluations influence individuals' health outcomes.

Fifth, future research should consider collecting data from both members of

the couple to account for the dyadic nature of individuals' romantic relationships. In previous work, researchers found that individuals' and their partners' trajectory of relationship evaluation scores over time interacted with one another (Campbell et al., 2010). When individuals had partners with lower levels of trust or more variable relationship evaluation scores over time, those individuals also experienced greater variability of their relationship evaluations over time. It would be interesting to examine if greater variability of relationship evaluation scores over time is associated with individuals' partners experiencing declines in physical health over time. For example, it is possible that individuals who have partners with more variable relationship evaluations over time experience health declines, as they are unable to predict their partners' feelings about the relationship from day to day, leading them to especially feel a lack of control over their own outcomes.

Sixth, future research should replicate these findings within a sample of more established couples. The current study relied on information collected from individuals in the very early stages of their relationships. The original hypothesis was that health effects resulting from fluctuating relationship evaluations would be especially salient for individuals in new relationships, given the activating nature of these early dating experiences. However, no support was found for this hypothesis, and in fact, findings suggested individuals with more variable relationship evaluations report higher levels of physical health, on average. In a sample of more established couples (e.g., married or cohabiting couples), a different pattern of results may emerge, as individuals within these relationships may invest more in and depend more on their partners and relationships.

Thus, a threat to that dynamic, in the form of a downturn of relationship evaluation scores, might be especially troubling and lead these individuals to suffer physically.

CONCLUSIONS

The current study provided mixed findings for the effects of variability on subsequent relationship fate and physical health outcomes, with greater variability being a significant predictor of both increased likelihood of relationship dissolution and *higher* average levels of self-reported physical health over time. This effect was qualified by a significant interaction, however, such that greater variability of relationship evaluations was associated with these higher average health levels, only when accompanied by higher levels of temporal dependency as well, compared to individuals with greater variability of but lower dependency of relationship evaluations. Thus, the extent to which individuals remain on a downturn or upturn in their relationship evaluations over time may be an important variable for consideration when examining how relationship evaluations operate over time and predict health outcomes. In sum, this dissertation provides a method for capturing the complicated nature of an individual's experience in a new relationship and emphasizes the diversity of those dating experiences.

Tables

Table 1. Descriptive Statistics for the Major Study Variables

Variable	*N*	*M*	*SD*	*Range*
Baseline Assessment				
Physical Health	202	3.59	0.54	1.00–5.00
Relationship Length	202	3.28	1.74	.20–6.83
Destiny Beliefs	202	4.35	1.75	1.00–8.67
Growth Beliefs	202	7.38	1.23	1.67–9.00
Biweekly #1				
Physical Health	202	3.65	0.55	2.00–5.00
Relationship Length	202	3.83	1.74	.63–7.30
SMD	202	88.98	14.09	31.00–105.00
Biweekly #2				
Physical Health	202	3.62	0.63	1.00–5.00
Relationship Length	202	4.41	1.76	1.03–7.87
SMD	202	90.21	15.67	21.00–105.00
Biweekly #3				
Physical Health	202	3.59	0.66	2.00–5.00
Relationship Length	202	5.08	1.77	1.57–8.97
SMD	202	89.68	17.70	23.00–105.00
Biweekly #4				
Physical Health	185	3.55	0.58	2.00–5.00
Relationship Length	185	5.68	1.85	2.00–9.33
SMD	185	90.70	16.70	22.00–105.00
Biweekly #5				
Physical Health	173	3.48	0.61	1.00–5.00
Relationship Length	173	6.25	1.89	2.47–9.87
SMD	173	89.55	18.84	17.00–105.00
Biweekly #6				
Physical Health	159	3.45	0.53	2.00–5.00
Relationship Length	159	6.89	1.84	2.97–10.93
SMD	159	91.07	17.37	19.00–105.00
Biweekly #7				
Physical Health	154	3.46	0.66	1.00–5.00
Relationship Length	154	7.49	1.88	3.67–11.57
SMD	154	91.01	18.66	17.00–105.00
Biweekly #8				
Physical Health	146	3.44	0.62	1.50–5.00
Relationship Length	146	8.06	1.92	4.40–12.67
SMD	146	92.69	16.26	33.00–105.00
Biweekly #9				
Physical Health	141	3.38	0.67	1.00–5.00
Relationship Length	141	8.62	1.89	4.90–13.50
SMD	141	91.83	18.22	15.00–105.00

Table 1, cont'd

Variable	*N*	*M*	*SD*	*Range*
Biweekly #10				
Physical Health	131	3.47	0.52	2.00–4.50
Relationship Length	131	9.17	1.90	5.40–13.43
SMD	131	94.07	15.37	15.00–105.00
Biweekly #11				
Physical Health	126	3.50	0.55	2.00–5.00
Relationship Length	126	9.75	1.99	5.87–14.43
SMD	124	92.93	16.84	17.00–105.00
Biweekly #12				
Physical Health	116	3.44	0.54	2.00–5.00
Relationship Length	116	10.22	1.97	6.50–14.93
SMD	116	93.56	15.84	35.00–105.00
Biweekly #13				
Physical Health	103	3.37	0.65	1.50–5.00
Relationship length	103	10.64	1.93	6.90–14.70
SMD	103	95.21	14.64	40.00–105.00
Biweekly #14				
Physical Health	88	3.38	0.62	1.00–5.00
Relationship Length	88	10.96	1.88	7.37–15.23
SMD	88	95.68	14.83	16.00–105.00
Biweekly #15				
Physical Health	71	3.41	0.63	1.00–5.00
Relationship Length	71	11.20	1.78	8.00–14.93
SMD	71	94.70	14.56	22.00–105.00
Biweekly #16				
Physical Health	53	3.40	.62	2.00–4.50
Relationship Length	53	11.47	1.68	8.50–14.37
SMD	53	96.30	11.96	41.00–105.00
Biweekly #17				
Physical Health	34	3.43	0.74	1.00–5.00
Relationship Length	34	11.79	1.76	9.03–14.70
SMD	34	95.60	12.62	59.00–105.00
Biweekly #18				
Physical Health	10	3.10	0.57	2.00–4.00
Relationship Length	10	11.67	1.93	9.57–14.47
SMD	10	97.19	19.19	43.00–105.00
Final Assessment				
Physical Health	113	3.47	0.61	1.50–5.00
Relationship Length	113	12.77	1.79	9.43–16.50
SMD	111	94.44	16.33	15.00–105.00

Table 2. Bivariate Correlations Among Major Study Variables

Variable	Destiny Beliefs	Growth Beliefs	SMD
Physical Health – Baseline	-.06	.10	
Destiny Beliefs		-.23**	
Growth Beliefs			
Physical Health – Biweekly #1			.27***
Physical Health – Biweekly #2			.04
Physical Health – Biweekly #3			.15*
Physical Health – Biweekly #4			.01
Physical Health – Biweekly #5			.11
Physical Health – Biweekly #6			.16*
Physical Health – Biweekly #7			.12
Physical Health – Biweekly #8			.21*
Physical Health – Biweekly #9			.26**
Physical Health – Biweekly #10			.12
Physical Health – Biweekly #11			.19*
Physical Health – Biweekly #12			-.05
Physical Health – Biweekly #13			.11
Physical Health – Biweekly #14			.18
Physical Health – Biweekly #15			-.03
Physical Health – Biweekly #16			-.05

Table 2 cont'd

Variable	Destiny Beliefs	Growth Beliefs	SMD
Physical Health – Biweekly #17			.43*
Physical Health – Biweekly #18			.68*
Physical Health – Final			.11

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 3. Descriptive Statistics and Relations Among Various Level and Intraindividual Variability Indices

Variable	*M*	*SD*	*Range*	Mean	Variability (Traditional Measure)	Variability	Temporal Dependency
Mean level	85.39	17.60	29.00-105.00	____	-.64***	-.48***	-.18**
Variability (Traditional Measure)	8.57	7.08	0-51.57			.82***	.11†
Variability	8.13	6.76	0-30.84			____	-.03
Temporal Dependency	0.09	0.43	0-1.0				____

†*p*<.10. *$p < .05$. **$p < .01$. ***$p < .001$.

Note. The scores of temporal dependency displayed in the graph above are the raw scores (and not the absolute value).

Table 4. Bivariate Correlations Between Primary Variables of Interest

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variability (1)		-.03	.18*	-.01	.14*	-.12†	-.20**
Temporal Dependency (2)			.07	.00	-.02	-.13*	.05
Health at Baseline (3)				-.05	.07	.01	.12†
Destiny Beliefs (4)					-.21**	-.01	-.04
Growth Beliefs (5)						.08	.01
Initial Relationship Satisfaction (6)							.27***
Emotional Stability (7)							

†$p<.10$. *$p < .05$. **$p < .01$. ***$p < .001$.
Note. The scores of temporal dependency displayed in the graph above are the raw scores (and not the absolute value).

Table 5. Life Table Describing the Timing of Relationship Dissolution

		Number			Proportion of	
Phase Interval	Time	Still in relationship prior to assessment	No longer in relationship at end of interval	Stopped participation at end of interval	Individuals who reported breakup at time of assessment	Individuals still romantically involved at time of assessment
Baseline	[BL,1)	202	___	___	___	1.00
Biweekly #1	[1,2)	202	___	___	___	1.00
Biweekly #2	[2,3)	202	___	___	___	1.00
Biweekly #3	[3,4)	191	11	16	.05	.95
Biweekly #4	[4,5)	177	9	13	.04	.90
Biweekly #5	[5,6)	161	12	13	.06	.84
Biweekly #6	[6,7)	155	5	5	.02	.82
Biweekly #7	[7,8)	149	6	8	.03	.79
Biweekly #8	[8,9)	144	3	5	.01	.77
Biweekly #9	[9,10)	135	7	10	.03	.74
Biweekly #10	[10,11)	131	1	6	.004	.73
Biweekly #11	[11,12)	120	6	10	.03	.70
Biweekly #12	[12,13)	112	4	13	.02	.68
Biweekly #13	[13,14)	101	2	15	.01	.67
Biweekly #14	[14,15)	86	2	17	.01	.66
Biweekly #15	[15,16)	68	3	18	.01	.64
Biweekly #16	[16,17)	52	1	19	.004	.64
Biweekly #17	[17,18)	33	1	24	.004	.63
Biweekly #18	[18,Final)	9	1	0	.004	.63
Final	[Final, post-study)	9	2	9	.01	.62

Table 6. Results of Fitting the Discrete-Time Hazard Model to the Time of Relationship Dissolution

	Model A	Model B	Model C
Baseline	—	—	—
Biweekly #1	—	—	—
Biweekly #2	—	—	—
Biweekly #3	-2.85***(.31)	-2.99***(.32)	1.60***(.54)
Biweekly #4	-2.98***(.34)	-3.01***(.35)	1.77***(.56)
Biweekly #5	-2.60***(.30)	-2.55***(.30)	2.37***(.54)
Biweekly #6	-3.43***(.45)	-3.29***(.46)	1.59*(.64)
Biweekly #7	-3.21***(.42)	-3.06***(.42)	1.86***(.61)
Biweekly #8	-3.87***(.58)	-3.71***(.59)	1.18(.73)
Biweekly #9	-2.96***(.39)	-2.75***(.39)	2.08***(.61)
Biweekly #10	-4.87***(1.00)	-4.65***(1.00)	.43(1.11)
Biweekly #11	-3.00***(.42)	-2.74***(.42)	2.45***(.62)
Biweekly #12	-3.33***(.51)	-3.08***(.51)	1.87*(.69)
Biweekly #13	-3.92***(.71)	-3.67***(.72)	1.34(.85)
Biweekly #14	-3.22***(.60)	-3.02***(.58)	1.11(.63)
Biweekly #15	-3.12***(.59)	-2.84***(.59)	2.36***(.75)
Biweekly #16	-3.95***(1.01)	-3.62***(1.01)	1.70(1.14)
Biweekly #17	-3.50***(1.02)	-3.22***(1.02)	2.05†(1.16)
Biweekly #18	-2.20*(1.05)	-1.79†(1.06)	1.16(.84)
Final	—	—	—
Days between assessments			.03*(.01)
Days together before study			-.01*** (.002)
Time known prior			-.01(.61)
Emotional stability			.04(.08)
Initial relationship satisfaction			-.14(.09)
Mean level relationship evaluations			-.06***(.01)
Variability		.06***(.01)	.07***(.02)
Temporal Dependency		.89***(.21)	2.15***(.46)
Variability X Temporal Dependency		.01(.03)	.03(.04)
Goodness of fit			
Deviance	1353.06	1240.56	489.08
AIC	1385.06	1278.56	624.13
BIC	1477.99	1388.51	441.08
n observations	2460	2409	2320
Wald statistic	χ^2 (18) =694.28***	χ^2 (21) = 689.70***	χ^2 (27) = 558.63***

†*p<.10.* **p* < .05. ***p* < .01. ****p* < .001.

Table 7. The Prediction of Physical Health Outcomes by Intra-Individual Measures of Relationship Evaluation Scores over Time

					95% CI	
	β	*SE*	*t*(200)	Effect Size *r*	*LL*	*UL*
Predicting average level across time						
Intercept	3.51***	.03	138.86		3.46	3.56
Initial relationship satisfaction	.03	.03	1.08	.08	-.02	.08
Average score of relationship evaluations	.005*	.002	2.22	.16	.001	.01
Temporal dependency of relationship evaluations	.17*	.07	2.46	.17	.04	.31
Variability of relationship evaluations	.01*	.005	2.22	.16	.001	.02
Temporal dependency X Variability	.02*	.01	2.06	.14	.001	.05
Predicting linear slope across time						
Intercept	-.02***	.004	-6.32		-.03	-.02
Initial relationship satisfaction	.002	.004	.44	.03	-.006	.01
Average score of relationship evaluations	.001	.001	1.33	.09	-.003	.001
Temporal dependency of relationship evaluations	-.003	.012	-.02	.001	-.02	.02
Variability of relationship evaluations	.001	.001	1.33	.09	-.001	.003
Temporal dependency X Variability	.002	.002	.93	.07	-.002	.006

Note. All predictors were centered to facilitate interpretation; the outcome health was not centered.

†*p*<.10. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 8. Simple Effects for Interactions between Variability and Temporal Dependency on Average Levels of Physical Health

	β	*SE*	*t*	Effect size *r*	95% CI LL	95% CI UL
Effect of variability with greater temporal dependency (+1 SD)	.02*	.01	2.67	.19	.004	.03
Effect of variability with lower temporal dependency (-1 SD)	.001	.01	.21	.01	-.01	.01
Effect of temporal dependency at high variability (+1 SD)	.30**	.09	3.21	.22	.12	.49
Effect of temporal dependency at low variability (-1SD)	.07	.10	.70	.05	-.13	.26

$^{\dagger}p<.10$, $*p<.05$, $***p<.001$.

Table 9. The Prediction of Physical Health Excluding Last Assessment for Individuals that Experienced Relationship Dissolution

					95% CI	
	β	*SE*	*t*(200)	Effect size *r*	*LL*	*UL*
Predicting average level across time						
Intercept	3.52***	.03	137.72		3.46	3.57
Initial relationship satisfaction	.03	.03	1.13	.08	-.02	.08
Average score of relationship evaluations	.005*	.002	2.12	.15	.001	.01
Temporal dependency of relationship evaluations	.20**	.07	2.75	.19	.06	.33
Variability of relationship evaluations	.01*	.005	2.45	.17	.002	.02
Temporal dependency X Variability	.03**	.01	2.80	.19	.01	.06
Predicting linear slope across time						
Intercept	-.02***	.004	-5.83		-.03	-.02
Initial relationship satisfaction	.002	.004	.47	.03	-.006	.01
Average score of relationship evaluations	.001	.001	1.00	.07	-.003	.001
Temporal dependency of relationship evaluations	.01	.01	.45	.03	-.02	.03
Variability of relationship evaluations	.001	.001	1.37	.10	-.001	.003
Temporal dependency X Variability	.004†	.002	1.74	.12	-.001	.008

Note. All predictors were centered to facilitate interpretation; the outcome health was not centered.

†*p*<.10. *$p < .05$. **$p < .01$. ***$p < .001$.

Table 10. Simple Effects for Interactions between Variability and Temporal Dependency on Changes in Self-Reported Physical Health

					95% CI	
	β	*SE*	*t*	Effect size *r*	LL	UL
Effect of variability with high temporal dependency (+1 SD)	.01**	.004	2.91	.20	.004	.02
Effect of variability with low temporal dependency (-1 SD)	-.01	.004	-2.58	.17	-.02	-.003
Effect of temporal dependency at high variability (+1 SD)	.20**	.07	2.80	.19	.06	.35
Effect of temporal dependency at low variability (-1SD)	-.19**	.07	-2.74	.19	-.33	-.05

Note. All variables were centered for analyses. CI=confidence interval; LL=lower limit; UL=upper limit.
$^{\dagger}p<.10$, $*p<.05$, $***p<.001$.

Table 11. The Prediction of Physical Health by the Interactions with Destiny Beliefs

	β	*SE*	*t*	Effect size *r*	95% CI *LL*	*UL*
Predicting average level across time						
Intercept	3.51***	.03	137.11		3.46	3.56
Initial relationship satisfaction	.02	.03	.82	.06	-.03	.08
Average score of relationship evaluations	.01**	.002	2.59	.18	.001	.01
Temporal dependency of relationship evaluations	.18*	.07	2.45	.17	.034	.32
Variability of relationship evaluations	.01*	.005	2.17	.15	.001	.02
Destiny beliefs	.02	.02	.12	.01	-.03	.03
Initial relationship satisfaction x Destiny beliefs	.03†	.02	1.88	.13	-.001	.06
Average score x Destiny beliefs	-.001	.001	-.58	.04	-.003	.002
Temporal dependency x Destiny beliefs	.03	.04	.81	.06	-.05	.11
Variability x Destiny beliefs	.001	.003	.46	.03	-.004	.006
Predicting linear slope across time						
Intercept	-.03***	.004	-6.36		-.03	-.02
Initial relationship satisfaction	.002	.004	.41	.03	-.01	.01
Average score of relationship evaluations	.001	.001	.99	.07	-.001	.001
Temporal dependency of relationship evaluations	-.01	.01	-.41	.03	-.03	.02
Variability of relationship evaluations	.001	.001	.93	.07	-.001	.003
Destiny beliefs	.002	.002	.93	.07	-.002	.007
Initial relationship satisfaction x Destiny beliefs	-.001	.003	-.19	.01	-.006	.005
Average score x Destiny beliefs	-.01*	.001	-2.04	.14	-.001	0.00
Temporal dependency x Destiny beliefs	.01	.01	1.64	.11	-.002	.02
Variability x Destiny beliefs	-.001	.001	-1.26	.09	-.001	.001

†*p*<.10. *$p < .05$. **$p < .01$. ***$p < .001$.

Note. The predictors were centered to facilitate interpretation; the outcome health was not centered.

Table 12. The Prediction of Physical Health by the Interactions with Growth Beliefs

	β	*SE*	*t*(200)	Effect size *r*	95% CI *LL*	*UL*
Predicting average level across time						
Intercept	3.51***	.03	133.51		3.46	3.60
Initial relationship satisfaction	.02	.03	.84	.06	-.03	.08
Average score of relationship evaluations	.01*	.002	2.32	.16	.001	.01
Temporal dependency of relationship evaluations	.18*	.07	2.45	.17	.04	.32
Variability of relationship evaluations	.01*	.01	2.15	.15	.001	.02
Growth beliefs	.02	.02	.82	.06	-.03	.06
Initial relationship satisfaction x Growth beliefs	-.001	.02	-.06	.01	-.05	.05
Average score x Growth beliefs	-.002	.003	-.72	.05	-.01	.003
Temporal dependency x Growth beliefs	.04	.06	.72	.05	-.07	.15
Variability x Growth beliefs	.002	.004	.40	.03	-.01	.01
Predicting linear slope across time						
Intercept	-.02***	.004	-5.95		-.03	-.02
Initial relationship satisfaction	.002	.004	.38	.03	-.01	.01
Average score of relationship evaluations	.001	.001	1.23	.09	-.003	.001
Temporal dependency of relationship evaluations	-.01	.01	-.41	.03	-.03	.02
Variability of relationship evaluations	.001	.001	1.10	.08	-.001	.003
Growth beliefs	-.003	.003	-.94	.07	-.01	.003
Initial relationship satisfaction x Growth beliefs	-.01†	.004	-1.86	.13	-.01	.001
Average score x Growth beliefs	.003	.001	.70	.05	-.01	.001
Temporal dependency x Growth beliefs	.01	.01	.72	.05	-.001	.02
Variability x Growth beliefs	-.001	.001	-.74	.05	-.002	.01

†$p<.10$. *$p < .05$. **$p < .01$. ***$p < .001$.

Note. The predictors were centered to facilitate interpretation; the outcome health was not centered.

Figures

Figure 1. Distribution of Temporal Dependency Raw Scores at Lag 1

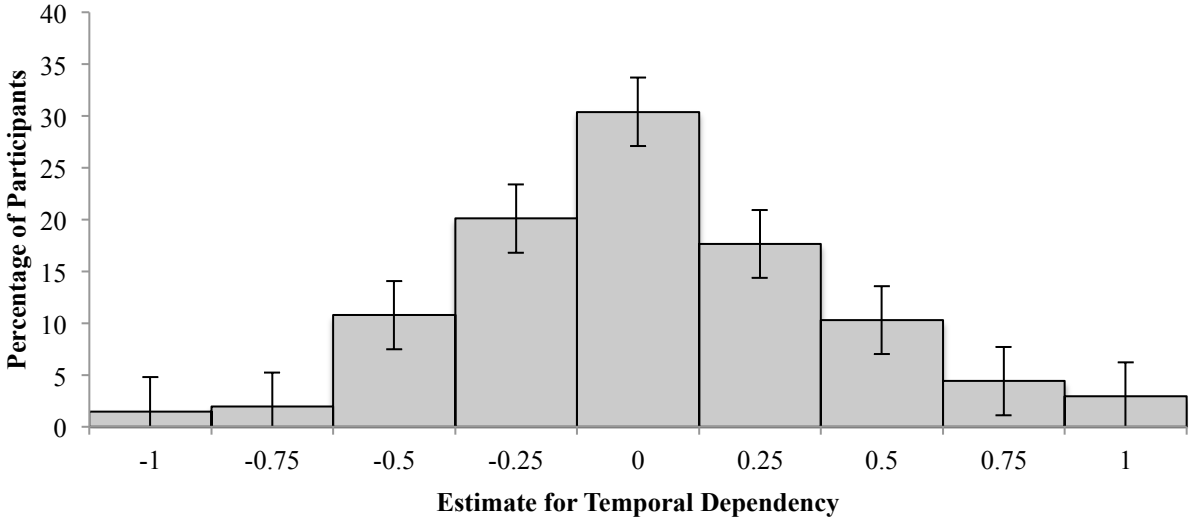


Figure 2. Examples of Participants' Trajectories

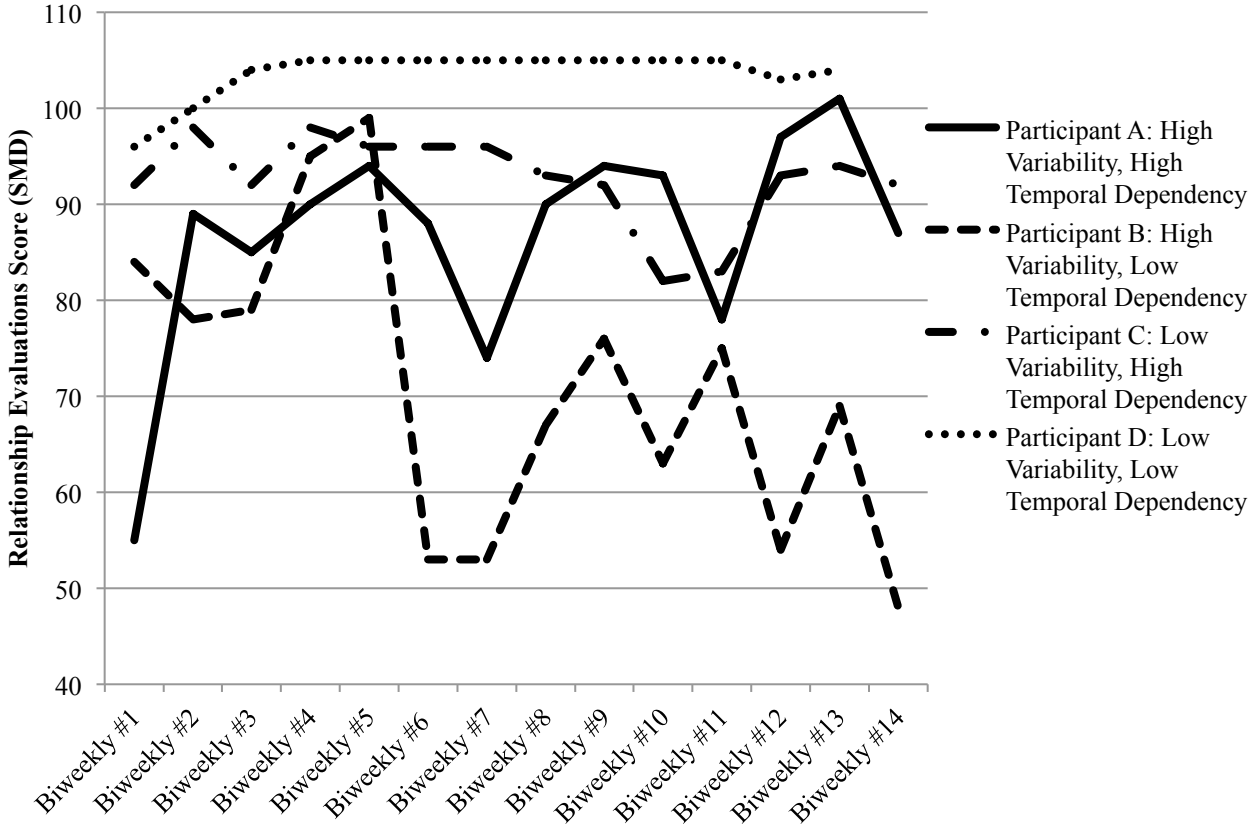


Figure 3. Estimated Hazard of Dissolution

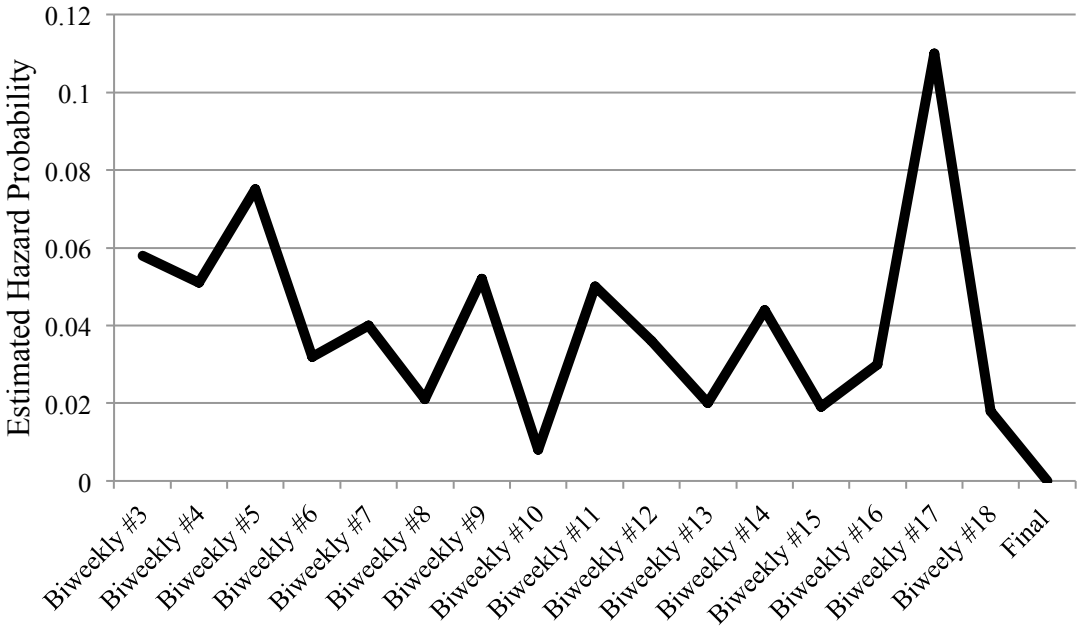


Figure 4. Estimated survival probability within group that experienced dissolution

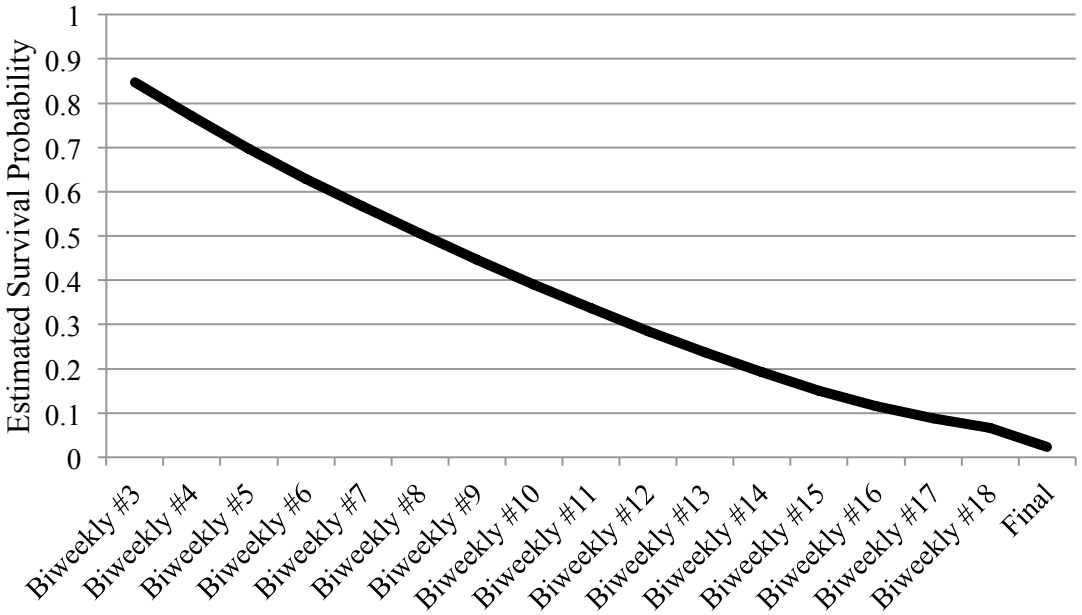


Figure 5. Model-predicted probability that an individual remains partnered (i.e., survival probability) across assessments by different levels of variability

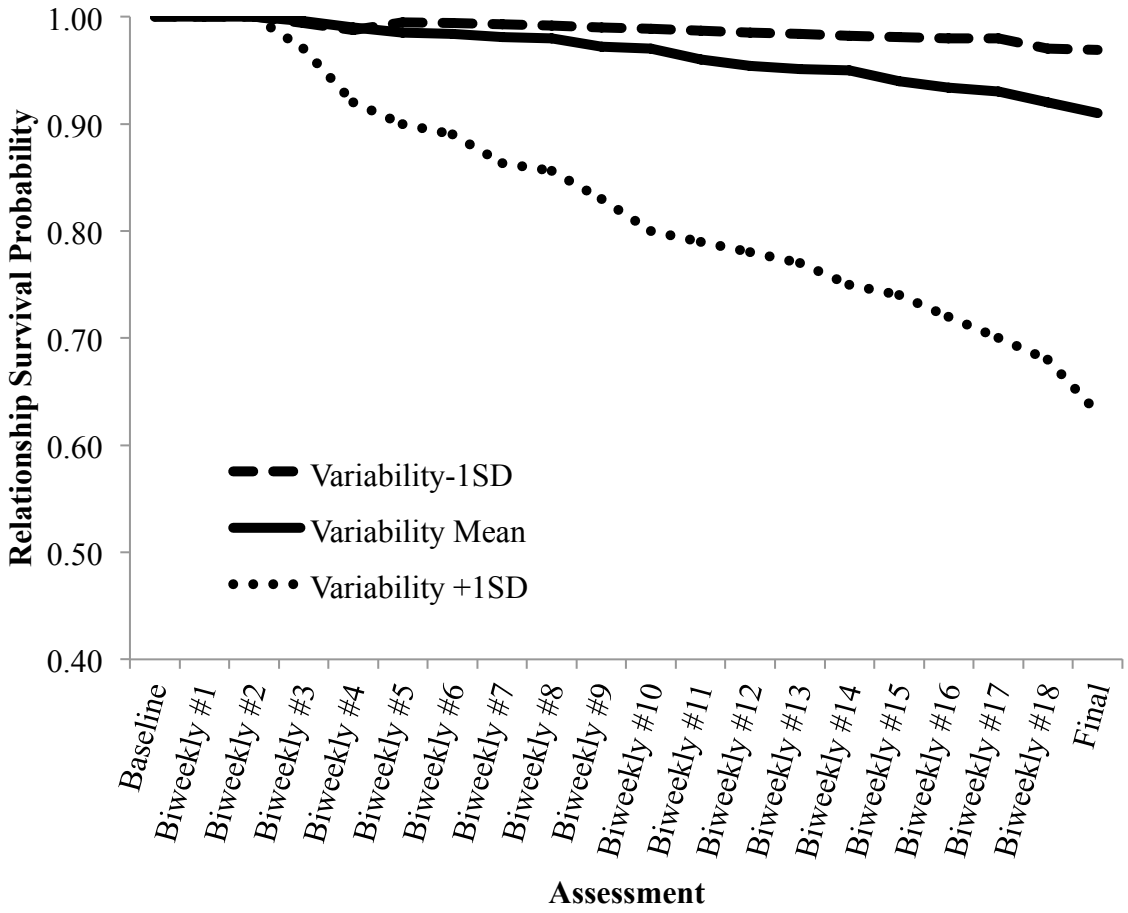


Figure 6. Interaction of Variability and Temporal Dependency on Average Levels of Health

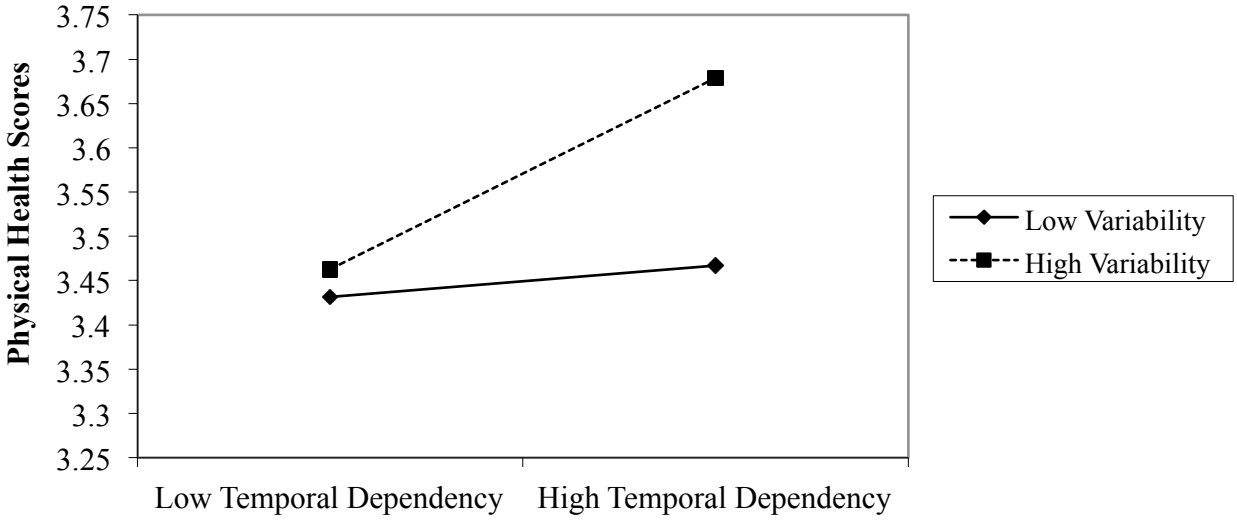
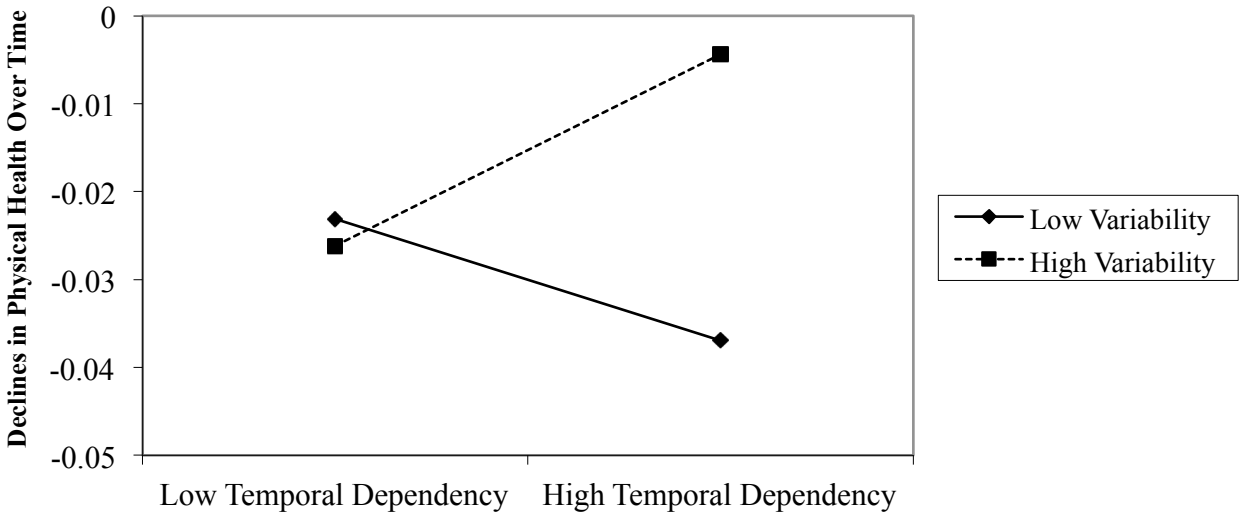
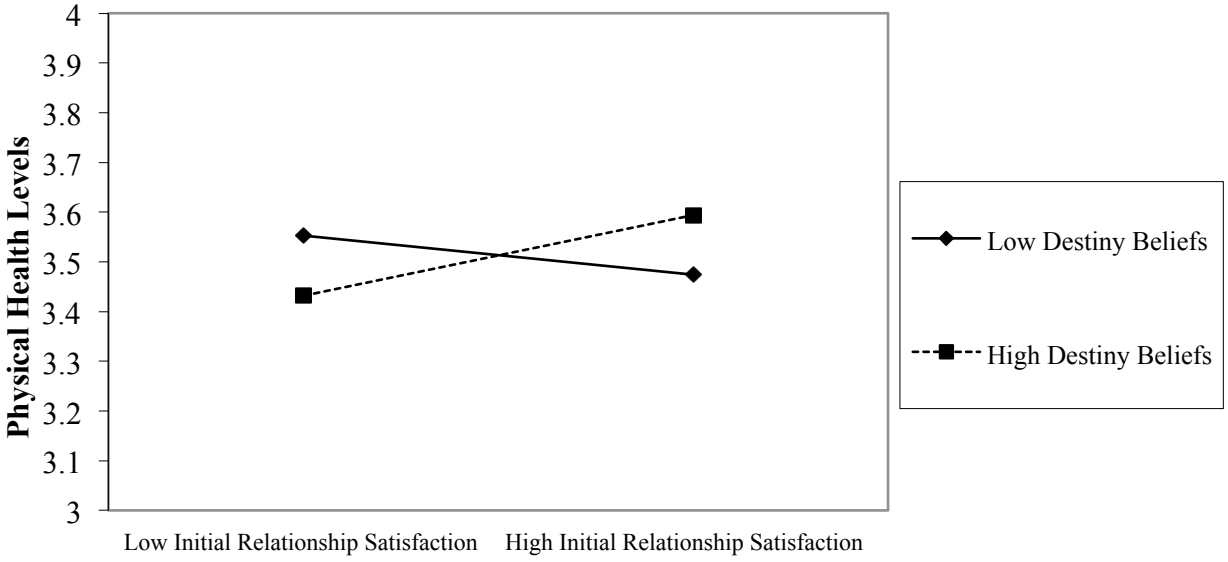


Figure 7. Interaction of Variability and Temporal Dependency on Changes in Physical Health Over Time



Note. The last assessment of health is not included for individuals who experienced a breakup.

Figure 8. Interaction of Destiny Beliefs and Initial Relationship Satisfaction on Average Physical Health



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